

AMERICAN **FORESTS**



FEBRUARY 1940

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talk to us when he's out of town. And Mother would be tied down just something awful.

"And suppose one of us suddenly took sick? Or there was a fire? Or a robber, maybe? Well, I don't worry about those things when I see the telephone.

"Doesn't cost much either, my Daddy says. And Mother says, 'I don't know what I'd do without it.'"

BELL TELEPHONE SYSTEM



AMERICAN FORESTS

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THE AMERICAN FORESTRY ASSOCIATION

919 Seventeenth Street
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The American Forestry Association is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities, of which publication of AMERICAN FORESTS is one, seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, in order that they may contribute permanently and in the highest degree to the welfare of the nation and its people.

In addition to publication of two magazines — AMERICAN FORESTS and CONSERVATION, both designed to keep before the people of the country important conservation questions and issues, the Association carries on educational projects in various fields including forest fire prevention, reforestation, protection and propagation of fish and wildlife, upstream flood control, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, development of forestry by private endeavor and the teaching of conservation in the schools of the country.

The Association is independent. It has no connection with any federal or state governments. It is non-political and non-commercial. All its resources and income are devoted to the advancement of conservation. It has been so operated since its founding in 1875. All citizens interested in forestry and conservation are eligible for membership.

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Member A. B. C.

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READERS' FORUM

AN EDITOR SPEAKS

SIR: You always publish a beautiful monthly number of *AMERICAN FORESTS*, an editorial job that leaves me no room for constructive suggestion. It occurred to me that I would like to tell you that I particularly enjoyed the "piece" entitled "Ole Swan Svenson Settles Down," by W. S. Bromley. Mr. Bromley has a good style and a human interest touch.

It is amazing what has happened throughout the South in little more than a decade. Selective logging is being practiced on a wide scale and I am gradually substituting conviction in place of hope that the next generation will see a balanced program of forest practices and provide plenty of wood for sawmills and for poles and ties as well as for naval stores and pulpwood.—*J. B. Wand*, Editor, *Southern Lumber Journal*, Jacksonville, Florida.

IN DEFENSE OF THE COYOTE

SIR: Mr. Stanley P. Young's article in the November issue of *AMERICAN FORESTS* on the coyote deserves some comment.

The scientific name of the coyote is *Canis latrans Say*, which translated into English is "barking dog," not "dog robber," as Mr. Young states. In 1823, when Thomas Say, the Philadelphia naturalist, published his description of this animal in "Long's Expedition to the Rocky Mountains," Vol. 1, Page 168, the coyote had not yet had the stigma of "robber" attached to its name.

The photographs purporting to be live coyotes are dead ones posed for the purpose.—*William M. Rush*, Portland, Ore.

TRAIL RIDERS PLEASE NOTE

SIR: I have had it on my mind for a number of weeks to write to you bespeaking your consideration of another Association Trail Rider expedition to the Great Smokies. It was keen disappointment to a number of us that the Smokies were not included in the 1939 program. I spent a week in September with Tom Alexander at the new Cataloochee Ranch near Waynesville, North Carolina, and did some riding in the Park, and I would like very much to have an opportunity to join in another ride under the sponsorship of the

Association in the Great Smokies in 1940. I am quite sure that you would have a ready response to any expeditions planned in the Smokies.

I feel that members of the Association living on the Atlantic seaboard, while they might like to join in some of the expeditions in the western part of the country, find that the great distance to travel in order to join an expedition precludes acceptance by some who otherwise might sign up. With the Great Smokies evidently the only eastern expedition possible for consideration by the members, it seems too bad that they are not given at least the opportunity to enjoy this beautiful Park.—*Clarence B. Clapp*, Hartford, Connecticut.

THE ELEVENTH COMMANDMENT

SIR: I would like to thank you for publishing "The Eleventh Commandment," by Walter C. Lowdermilk, which appeared in the January issue. Without hesitation, this is the most inspiring article I have ever read on conservation, and I hope everything possible will be done to get it before every man, woman and child in America. If reprints are available, readers of *AMERICAN FORESTS* should take it upon themselves to see that such a movement is started. For one, I will personally distribute several hundred throughout my neighborhood—in churches and schools, in neighborhood clubs and meeting places, and to many individuals. I hope other members will do the same thing.—*Mrs. Thelma Cannon*, Los Angeles, California.

GETTING TEARFUL ABOUT FIRE

SIR: Your fire prevention issue (April, 1939) was a wonderful plea for protection. How little people heed such pleas our western fire toll tells, and how much of it is carelessness I had a number of opportunities to note at first hand in the mountains last summer. I hate to admit it, but observation revealed that women smokers seem less aware of tinder-dry needles than men. They seem to discard ashes and stubs as casually as if they were in a boat. I wish the beauty and service and actual protection the forests give could reach our American emotions. An

emotional American will plead for feather pillows for a Capone; so what they might do for fire protection if they got tearful on the subject would be a miracle.—*Mora M. Brown*, Riverside, California.

CALLING ALL FORESTERS

SIR: Foresters throughout the United States, Canada and Alaska who would like to have their interesting experiences broadcast are invited to send accounts of such adventures to George Schroeder, assistant professor of forestry, Oregon State School of Forestry, Corvallis, Oregon. Such tales are presented by "Foresters in Action" every Thursday night over KOAC, Oregon's state-owned radio station. These programs are given for the entertainment of the public and for better understanding of America's forests, forest products, and fire prevention problems.—*Cherry Briggs*, Corvallis, Oregon.

ON THE WAGE-HOUR LAW

SIR: With regard to "Effect of the Wage-Hour Law on the Southern Lumber Industry," by Professor McKean, which appeared in *AMERICAN FORESTS* for January, I question the correctness of the statement that the actual labor costs of producing lumber in the South is higher than on the West Coast. The minimum wages on the Coast are more than twice the minimum prescribed by law for the South. Many of the operators in the Douglas fir region are paying an average of seventy cents an hour.

I do not know what percentage of the total cost of production in the West is represented by direct labor costs, but for the small mills of the South it runs around sixty per cent. To use felling and bucking as an illustration, the costs of this operation in the Douglas fir region runs around \$1.50 a thousand, while in the South it ranges from seventy-five cents to \$1.00.

The Forest Service recently made a study of the effect of the wages and hour law on a number of products of the small mills in the South. I had charge of the field work. The general contract price in North Carolina was about \$7 a thousand, which included logging, milling, and piling the lumber at the mill site.

It is my judgment that the direct labor costs in the South are somewhat lower per thousand feet for logging and milling than it is in the West Coast territory.

The article also states that "sawmill men" estimate the number of people employed has increased from four to seven per cent as a result of the wage-hour law. This is true in some cases, but not as a general rule. I know of several large mills in the South that have actually reduced the number of employees by mechanizing their operations.

Elsewhere it is claimed that costs have been increased from \$2 to \$3 a thousand as a result of the wage-hour law. This is true in some cases but not as a general rule.—*James W. Girard*, Assistant Director, Forest Survey, U. S. Forest Service, Washington, D. C.



FORESTS FOREVER!

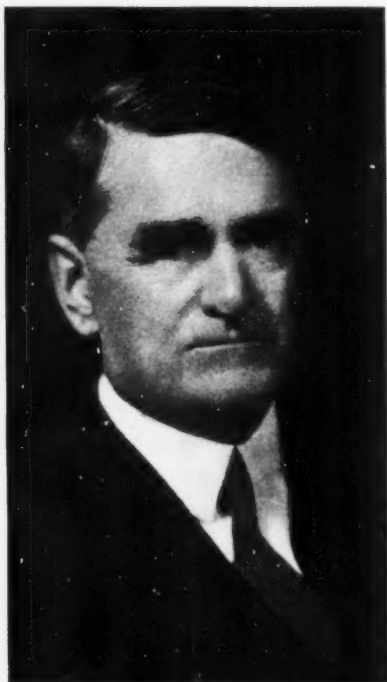
So long as there is earth to hold the roots of trees, and rain, sun and air to feed them, this nation will never lack timber! For the far-sighted, far-reaching program of the Forest Service has at long last captured the popular imagination . . . and thereby gained a new and irresistible momentum.

In the forefront of forest workers are "Caterpillar" Diesel Tractors — lending their sure-footed power, dependability, and economical operation to the huge task of turning plans into concrete achievement!

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COL. JOSEPH HYDE PRATT

BORN in Hartford, Connecticut, on February 3, 1870, Col. Pratt comes of New England, or rather Old England ancestry, for it was John Pratt of Stevenage, Hertfordshire, England, who came to America in 1632 and founded the family here. Settling in Hartford, Connecticut in 1636, he was one of the members of the Rev. Thomas Hooker's party.

Col. Pratt has been a Director of The American For-

OUR DIRECTORS

estry Association since 1923. Now attached as Senior Engineer Consultant to the United States Geological Survey, he has had a distinguished career as a scientist, his chief interest for years lying in mining, mineralogy and geology. After he was graduated from the Sheffield Scientific School of Yale in 1893, he remained as an instructor in mineralogy until 1897. State mineralogist for North Carolina and lecturer in the science from 1897 until 1901, he joined the United States Geological Survey and remained with it until 1910. As an independent consulting engineer, in subsequent years, Col. Pratt has examined mines and mineral lands in over thirty states and in Canada, Mexico and Cuba. Awarded the honorary degree of A.M. in 1923, he has written widely in the fields of mineralogy and the mining industry and the reclamation of lands and prevention of pollution. His interest in social service is indicated by the fact that he is Director of the North Carolina Conference.

In addition to his scientific work, Col. Pratt has a military record to be proud of. A member of the Connecticut National Guard, he was commissioned Colonel of Engineers in that body in 1913. When the United States entered the World War, he was commissioned Major and given command of a battalion. Promoted Lieutenant Colonel in 1917, his regiment went overseas in 1918 with the 30th Division, serving first with the British Army in Flanders and later with the 2nd American Corps in the Somme sector. He was commissioned Colonel in October, 1918, and his regiment received official praise for fearlessness under fire. Col. Pratt, awarded the Distinguished Service Medal, was especially commended for his efficiency in providing light railways for the transportation of food and ammunition supplies for the 2nd American Corps during the Somme offensive.

Col. Pratt makes his home at Chapel Hill, N. C. He is an enthusiastic camper and spends much time in the woods and mountains.

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THE PINEY WOODS of the South may be coming back but the southern hardwoods are showing them the way. While every one has been talking of the South as a rising empire of fast-growing pine, the hardwoods have been "sayin' nuthin'." But they have been doing some quiet growing on their own

account as evidenced by the recent discovery that today they occupy fifty-one per cent of the forest lands in the eight states of the lower South.

This is one of the surprising and outstanding findings of the forest survey of the region by the United States Forest Service. The hardwoods not only are nosing out pine in point of area occupied, but they are showing it clean heels in point of wood volume. Of the 1,500,000,000 cords of usable wood which the survey found in the lower South, hardwoods constitute today sixty-three per cent.

In still another way southern hardwoods are out-pointing their pine brethren. Growth is exceeding losses from cutting and mortality by some 7,000,000 cords a year. Mortality means losses due to fire, insects, disease, wind and over-crowding of young stands, —a source of drain that might be greatly reduced by better protection and management.

Unheralded and unsung, the hardwood family has been multiplying itself into a new and great generation of timber in the deep South. Barring catastrophe of fire and wind, it will continue to do so until methods are found to utilize its accumulating growth of raw wood. Present market demands are mainly for high grade material leaving inferior and cull trees and limb wood unmarketable. Here, according to I. F. Eldredge, director of the southern survey, is a challenge to research and industry to find ways and means of converting this mass of cheap wood into products for domestic and foreign markets.

* * * * *

THE TIME has come, declares the American Association of Nurserymen in a bulletin issued last month, for the government to stop its invasion of the commercial nursery field with government grown planting stock. The nursery industry, it asserts, faces imminent disaster from the rapidly growing and unjustifiable menace of government tree nurseries. And in support of the claim, the nurserymen marshal information that is revealing, to say the least, in showing the mushroom growth of governmental tree nurseries in recent years.

Seven bureaus, they assert, are now operating tree nurseries supported wholly by Federal funds and many state nurseries are supported in part by federal money. Federally supported nurseries have increased from ten in 1926 to ninety-one in 1938 and their output of nursery stock has increased from 10,000,000 to over 500,000,000 plants.

Pointing out that the original justification for government nurseries was the growing of planting stock for the production of timber on public lands and farmers' woodlots, the nurserymen maintain the government has gone far beyond these limits and is growing and distributing not only species of forest trees but a great many ornamental varieties for private planting.

They further charge that these federal nurseries are an unnecessary expense upon the public in that commercial nurseries can supply the planting needs of the government at a less cost than those shown by federally operated nurseries.

On the basis of the showing made, the nurserymen have a justifiable grievance. They do not contend that the government should abandon its nursery practice but rather that government nurseries should be limited to the growing of trees for experimental, educational and timber-producing purposes on public lands and that the growing of stock needed for other purposes should be contracted for through local nurseries, — a position which has reasonableness to support it. The government's side of the case is yet to be heard.

Orin Foster
Editor.

THE PINEY WOODS ARE COMING BACK

By OVID BUTLER

The glory of the Virgin Pines —
Nature's heritage to the Southland



**There's Glory Too In
A Planted Forest of
Southern Pine Re-
splendent with Health
and Rapid Growth —
Each Tree Crowding
for its Place in the Sun**



A man-planted forest of slash pine in Louisiana. These trees are only six years old

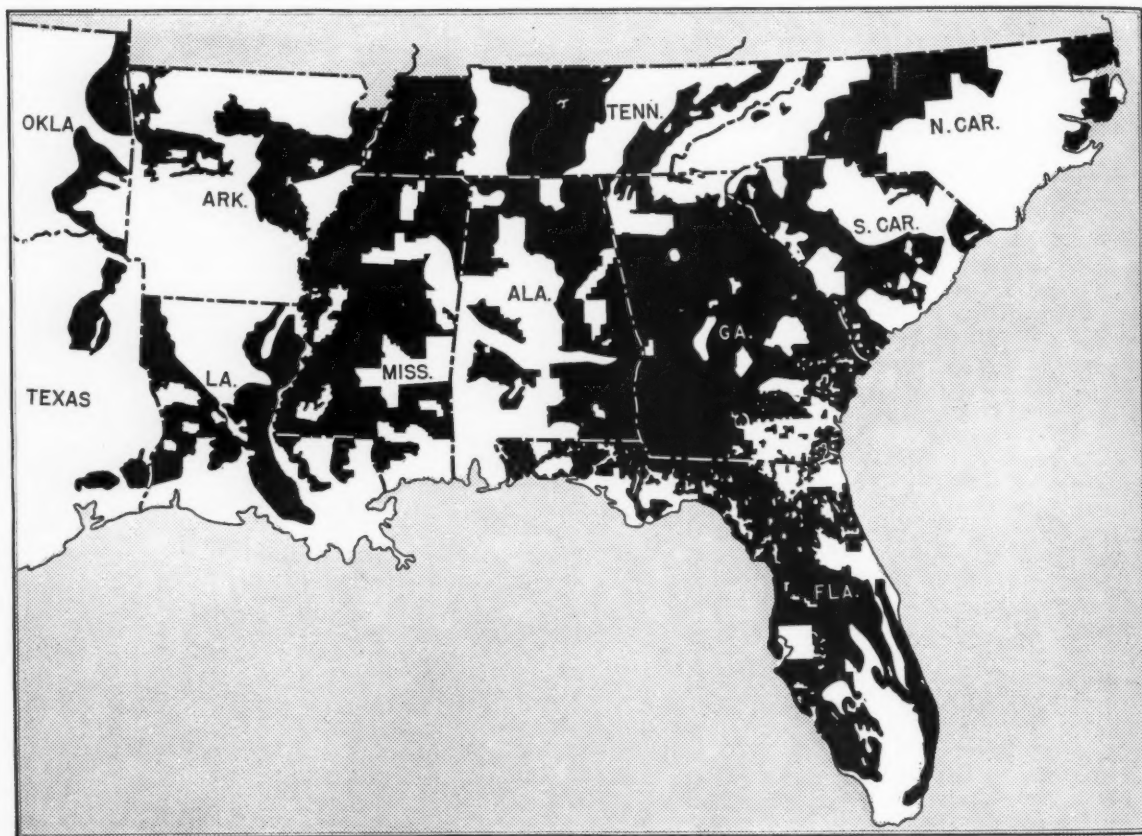
FOR half a century, the South has been the scene of the greatest and most prolonged forest exploitation in American history. Blessed with soils and climate that bequeathed it pine forests of incomparable extent, quantity and quality, its timber products have moved by rail and water into all parts of the nation and into far corners of the world. For years, lumber, ties, poles, naval stores and more recently pulp from the southern pineries have helped to build and maintain the economic life of the country. To the South, the virgin pine forests, glorious in the majesty of their maturity, have been a living wealth, from which an industrial empire of lumbering rose, only to awaken after a few decades to a realization that its sources of permanent sustenance were being destroyed by its own methods of destructive lumbering.

"Cut out and get out methods," men called them—methods that mined the soil of its trees and left scalped land by the millions of acres to fire, tick-infested cattle, chance colonization. "The piney woods are cutting out" became an accepted maxim, starkly emphasized by dismantled mills, ghost towns, horizons of cut-overs. The empire of King Pine faced decline as the harvesting of nature's crop moved toward twilight. Foresters urged reforestation—the growing of new crops of pine. "It won't pay—too long an undertaking," said most industrialists, and accepted a laissez-faire destiny. A few however saw in the quick-growing pine and its quick-comeback after cutting a chance to perpetuate their industry. They employed foresters and began to husband the growing power of their timberlands. Then came the depression and the collapse of King Cotton. The South became the nation's economic problem number one. In the warm sunlight lay two intermingled empires of broken land—cotton and pine, over which economic leaders cast searching eyes for avenues of reconstruction. And in the cut-overs they caught a new vision.



Another slash pine plantation—in Georgia—which is quite grown up at twelve years of age

THE piney woods were coming back! Everywhere the cutovers had been greening up—right under their very eyes and unappreciated. Mother Nature had beaten them to the draw in the matter of reconstruction. For years she had been calling back her children to the land of their fathers and they had responded with all the vigor of a race rooted for centuries in soils of its own self preserved fertility. Breasting the ax and the saw, yearly fires, neglect, they kept coming back, winning a place here and a place there, consolidating and extending gains by releasing winged seeds to the wind. Long established sawmills were remaining in place a little longer because lands they had cut in earlier years had grown back to pines of marketable size. Second-growth pine had become a lumber trade term. Paper manufacturers in the North, marking the possibilities of quick growing pine and the extent of its spread, had ventured southward—slowly at first and then in the late thirties with millions of dollars. Suddenly the eight states of the lower South awoke to find within their borders some twenty-five pulp mills either operating or in course of construction, staking their future on new generations of pine.



Problem No. 1 in helping the piney woods to come back is control of forest fires. While progress has been made by private owners, the states and the federal government working individually and cooperatively, the extent to which the problem is still unsolved is shown by this map on which the black sections show the regions of the lower South in which forest lands are still without organized protection

THE piney woods not only were coming back but they had come back in a slow moving industrial drama that has at last captured the minds of many southern leaders. In it they vision what foresters have long visioned—a reconstructed empire of pine forests, grown, managed and harvested as a perpetual crop and forming an economic base for the South comparable to and possibly greater than that of agricultural crops. In it, they see potentialities of a farm, forest and industrial economy not possible of attainment in any other section of the country. Upon what are these potentialities based? The South can grow a tremendous volume of raw wood—both pine and hardwoods. Raw wood is the basis of many industries. Today the forests of the lower South support over 10,000 wood-using plants. Progress in converting raw wood into new products, thus creating new industries, is on the ascendency. Of the 213,000,000 acres of land in the lower South, fifty-eight per cent, or 122,000,000 acres, is productive forest land on which a recent survey by the government found over a billion cords of growing wood including both pine and hardwoods. These forests are growing at the rate of 48,000,000 cords a year.



Given protection from fire, a few seed trees will soon bring back the baby pines by the thousands

THE southern pines are prolific seeders and rapid growers. Given protection from fire, they reproduce abundantly and if marketable stands are cut by leaving seed trees or young growth the land can be always maintained in trees yielding periodic crops of wood. But fire is today the piney woods' arch enemy. It primarily is responsible for the understocked condition of the second growth stands. In point of area annually burned over, the South leads the nation. The traditional custom of its people of burning the woods to improve the grazing is so entrenched and widespread that the combined efforts of forest owners, states and federal government thus far have been able to provide protection to only a small percentage of the pine lands. The great area that still needs organized protection is graphically shown on the opposite page.

WHILE the net increment of forest growth in the South is not great and varies from year to year according to market demands, the possibilities of increased growth through better forest practices and better protection from fire are tremendous. Seventy-five per cent of the forests by area are second growth—trees that have come back to the land following cutting and fires and without much conscious or purposeful help from man. The lands therefore are understocked and are yielding, according to the Forest Survey, only one-fourth to one-half the growth they are able to produce. If this is true, the pine lands alone are capable of growing double the amount of wood that is now being cut from them. Here is the South's great opportunity for forest management and expansion of forest industries.



A scene common in the piney woods where fire still runs uncontrolled on millions of acres



A man-made forest nursery—one of many in the South where pines are grown for field planting

TO increase the stocking of thin stands and to plant areas that have been so destructively logged and burned that they are barren of trees, forest nurseries in increasing numbers are today helping the piney woods come back. The federal government, the states and many private owners are now operating nurseries and raising millions of trees for field planting. It has been estimated that during the past five years over 500,000 acres have been planted. While more fully stocked stands may be assured by planting, nature is the most economical nurseryman in the South. When forests are properly managed, protected and selectively logged, it is seldom necessary to resort to the added expense of artificial planting.

AN interesting and significant aspect of the comeback of the piney woods is its large proportion of farm ownership. Almost one-half of the land it has repossessed is in farms. As through the years owners have abandoned their farms or let fields go uncultivated, the pines have moved in and taken their stand. And sooner or later many a farmer and land owner has awakened to the fact that he had a cash crop in his woodlands. Throughout the South today, thousands of small sawmills are subsisting on farm grown pine and in some sections large plants are operating exclusively or in part on timber from local farm woodlands. A farm-forest economy is already in the making.

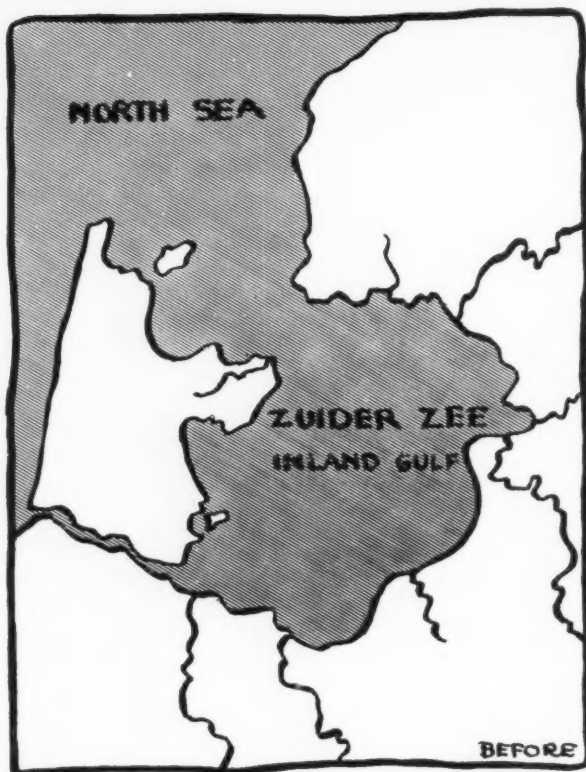
In most of the piney woods, Nature does her own nursery work sowing the seed directly—Scene in Henry Hardtner Forest, Louisiana





The piney woods as seen in the Ouachita National Forest, Arkansas, after a selective cutting. As the older trees left become marketable, they will be removed and the young growth will form the oncoming crop

THE piney woods lend themselves to fairly simple management but men who vision a new land economy for the South know there are many problems to be solved. First and foremost, woods burning must be brought under control if investments in land, timber and plants are to be protected. Improved cutting and management practices must be established if the full growing capacity of the land is to be attained. Numerous lumber and pulp companies have already moved in this direction but many have not. There is a great work of education to be done among the farmers to teach them to appreciate and handle their pine trees as a crop. Until the states and federal government give the farm woodlands proportional recognition with other crop lands, their problem will remain long unsolved. There are financial problems peculiar to individual ownership and industrial investments. There is the danger of over-cutting in boom times and the problem of future markets as the productive capacity of the pine lands are increased by better management and protection. The increased growth possibilities of the piney woods is so great that a permanent forest economy must have as a corollary constant research to improve the quality of the growth and to develop utilization outlets for surplus wood crops. But all these questions have their answers and American ingenuity is on the way to finding them.



HOLLAND BUILDS A MASTERPIECE OF LAND RECLAMATION

By W. C. LOWDERMILK

WE ARE accustomed in the United States to the miracle of making desert lands blossom like gardens with irrigation waters, but Holland has achieved an unprecedented miracle in de-watering the ocean and transforming hundreds of thousands of acres of ocean floor into productive agricultural lands. A change requiring ages of time by geologic processes was accomplished by the Dutch engineers in only a few years.

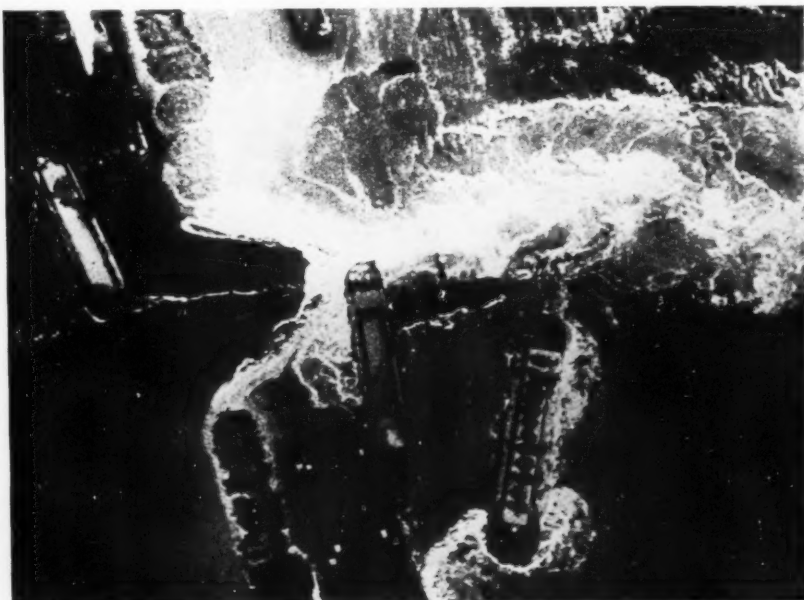
The drama of this reclamation of the ocean floor, unfolded step by step, is fascinating. It is being finished ahead of schedule, complete in all its blue print specifications. I have examined carefully this astonishing work, the result of infinite and painstaking planning, comprehensive and coordinated in all its details. And most wonderful of all, the able Dutch engineers, in spite of their

fully settled and level country, were able to provide practically all of the enormous quantities of materials needed for the many miles of huge dykes.

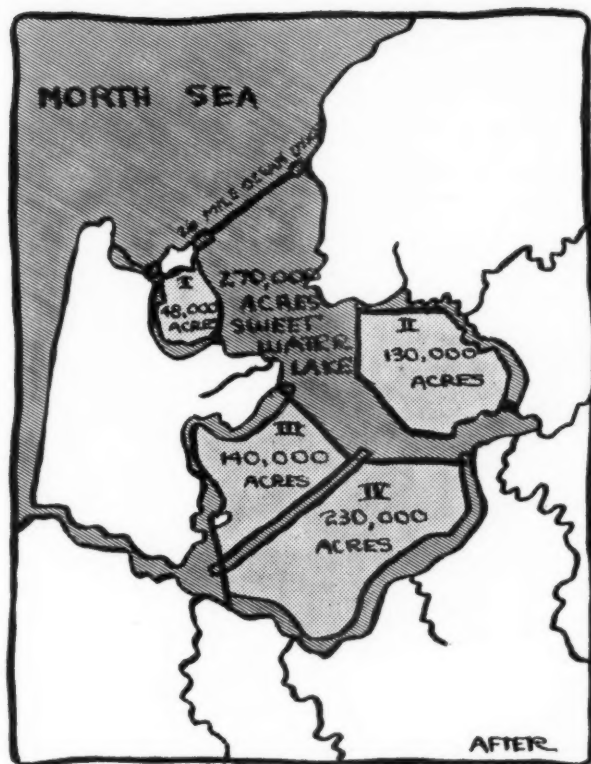
For almost a thousand years the Dutch engineers have been giving birth to small areas of new lands, but when these labor pains of the present Zuider Zee project are finally over, more than 550,000 additional acres, formerly inhabited by fish, will be occupied by people. Now the farmer actually plows the land over which the salt fisherman formerly plowed the waves. At the new town of Middenmeer, we went peacefully to sleep beneath a dyke, behind which the pounding ocean waves, if allowed, would have put us all at the bottom of the ocean again.

The creation of this Dutch agricultural heaven on the

A view from the air of Holland's last struggle with her old enemy, the North Sea. An armada of barges and dredges with cranes, filled to capacity, were rushed in and emptied into the last gap through which the rushing tidal water scoured to a depth of ninety feet before the final closing of the 26-mile ocean dyke shut them out forever.



Holland provides fertile new lands for her people through a bloodless conquest of the Kingdom of Neptune. For a thousand years Holland's worst enemy, the Zuider Zee, or inland gulf of the North Sea—has now been conquered and forced to move out so that Holland farmers may move in on four areas of new-born lands, totalling 550,000 acres, and behind the 26-mile ocean dyke a much-needed sweet water lake is forming.



floor of the sea sounds quite simple, as Karel Kappee, the Czechoslovakian author, describes it, "they take a bit of sea, fence it and pump it out, and at the bottom is left a deposit to which a respectable slice of Europe, by means of its rivers, supplies its best soil, and the sea its finest sand; the Dutchman drains it, and sows grass there, the cows feed on it, the Dutchman milks them and thus makes cheese, which at Goulde or Alkmaar is sold to other countries and this, incidentally, is a suggestive example of metabolism."

Holland, once a part of Caesar's Gaul, is not divided into three parts, but into two parts, namely, land above and land below high tide level. Forty-five per cent of her land lies below high tide level while a quarter is below mean sea level. Her land has been sinking at the

rate of nearly four inches a century for the past 4,000 years. Holland is a land of alluvium, sands, silt, and clays eroded from the slopes and flanks of Germany, Switzerland and France, carried by the Rhine and Meuse Rivers, sorted, laid down, and spread out in a gulf of the North Sea, forming in times past great marshy delta flats and the ocean floor.

The Dutch are indeed a great people, who can hold back the tides; filch agricultural lands from the bottom of the ocean, keep their rivers, laden with the silt and floods from two other countries, confined safely within dykes and flowing above the level of their agricultural lands. When erosion from other countries filled the canals with sand and endangered the dykes, these sands were turned into an asset and used commercially for ex-



As a bird sees the first cultivated portion of the floor of the North Sea, after salt water and fish life were replaced by new towns and farms. A village is shown, under construction, in the center. Agricultural specialists nurse the land until it can be cropped to clover, and it is then turned over to individual farmers for cultivation

tensive building programs. They expertly use locks to keep canals level and thereby avoid floods, regardless of excessive rainfall; for this purpose they early brought the picturesque old Dutch windmills to their assistance. I saw one of these masterpieces of engineering in stone and oak which had been in use for more than 200 years, still in splendid condition, fanning its weather beaten face with its long wooden arms and lifting twenty-five cubic feet of water per second into the canal above.

The transformation of the Zuider Zee began two hundred years ago when a dreaming engineer declared it would be possible to dyke off the North Sea and turn a portion of the inland gulf into an ultimately sweet water storage lake, then to dyke off and to pump the water out of the remainder and reclaim the bottom of the sea for agriculture. Many doubting engineers decried the scheme, saying: "It can't be done." Several generations of engineers doubted, hoped and dreamed until finally this courageous project was fully worked out and found to be possible. For yet another generation the engineers discussed plans and details. In this they have had an advantage over the haste in which much of our work in the United States has been started.

Finally, a catastrophe hastened the passage of the bill to begin actual work in 1920, just as our disastrous dust storms of the southwest hastened the passing of the Soil Conservation Act of 1935 for our huge program of saving and reclaiming lands. A furious storm had broken the dykes of the Zuider Zee or inland gulf of the North Sea and flooded 32,000 acres of agricultural lands. Occurring at a time when the shortage of imported foods due to the World War was acute, this catastrophe emphasized the need for more land and put the long and carefully planned project into action.

Traveling over the picturesque elevated roads of Holland enroute to these new born lands, admiring the infinite panoramas of rural beauty and perfect adaptation of uses to the characteristics of the land, there seemed not a cubic foot of surplus earth to spare for more new dykes. The roads were built from the excavations of canals and drainage ditches. Where could a small country like Holland obtain sufficient material to build miles of massive structures when her level land seemed not to have a molehill to remove? The \$60,000,000 ocean dyke alone is twenty-six miles long and from ten to forty feet high and 200 feet wide, and the rushing waters scoured to a depth of ninety feet before the final opening was closed between the ocean and the gulf, requiring additional material to fill the gap. It was also necessary to enclose four "polders," or reclaimed areas of 550,000 acres with dykes of almost equal height. All this required many millions of cubic yards of material. Yet in the whole construction work, Holland provided as by a miracle all the material except a minimum of rock.

The Dutch engineers had solved these problems before work was begun. For several years they had taken more than 34,000 samples of the ocean floor. While the fish were still at play, the Dutch engineers knew just what portion of the ocean floor would produce wheat, truck crops, pasture, and forests, and on blue prints designated only unuseable portions for the new Yssel Lake, named after the beautiful Yssel River north branch of the Rhine, which flows into it. This lake will ultimately become sweet water as the former salt water is gradually diluted by the rivers and tributaries flowing through it.

The sampling engineers found on the ocean floor, just outside the proposed dam, in the North Sea, great quantities of heavy, sticky impermeable material of glacial origin, called "boulder clay." Not far distant was found

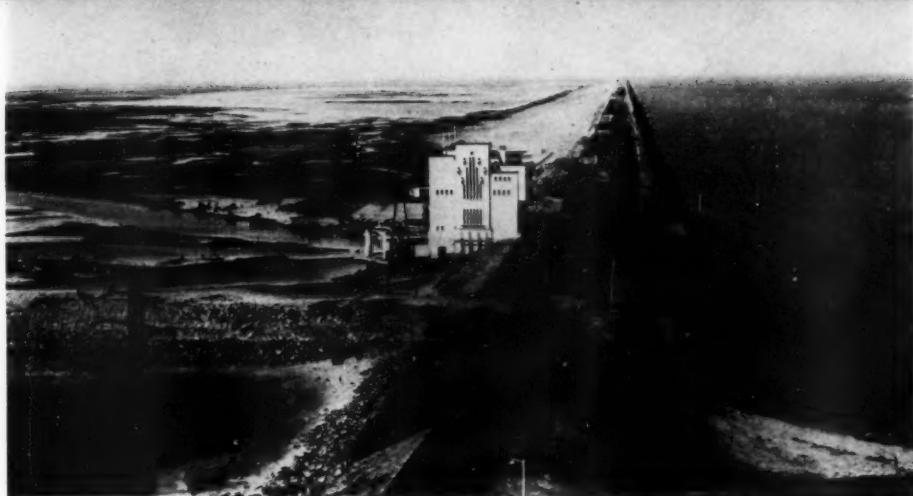
an abundance of fine sand. These two areas were attacked with a fleet of twenty-seven large dredgers, thirteen floating cranes and belt conveyors, 132 barges and eighty-eight tugs, and the North Sea was forced to disgorge into the construction of the ocean dyke alone some twenty million cubic yards of "boulder clay" and thirty-five million cubic yards of sand.

First, an artificial island was built up into the open sea, midway in the proposed twenty-six mile ocean dyke. Work proceeded in both directions simultaneously, from this island and from the mainland. Silt dams, made of mattress-like rafts, were loaded with rocks and sunk as a base for the dyke. Then the heavy sticky boulder clay was dumped on this from hopper barges by the opening of valves in the barge bottoms, until the depth of the sea was less than six feet and then from plain barges by means of floating cranes with grab buckets. Behind this mass of impermeable "boulder clay," sands from the floor of the sea were piled up to give width to the dyke and support to the clay facing. The sands were unloaded by grab buckets or disgorged directly from the large pipes of great suction dredges. Then the inner side of the dam was faced with "boulder clay" and finally both sides were covered with basalt rock above and brushwood mattresses below the water line, thus affording a completely adequate protection against storm tides.

The Dutch engineers left nothing to chance; everything had been worked out with precision for the final struggle with the treacherous invading ocean in closing the last three openings of 9,000 feet. The great Dutch physicist, Lorenze, in his hydraulic laboratory, worked out precise calculations of tidal change and the effect of the flow of water on the dykes. As the enclosing dam grew and neared completion the openings left for the passage of tidal waters became narrower and the velocity of the tidal flow was correspondingly greater. A veritable armada of ships containing material was assembled for the finish, and though at one moment, the force of the outward current scoured the small remaining opening to a depth of ninety feet, the last aperture was successfully closed on May 28, 1932, a full year ahead of schedule. A great assemblage of tugs, dredgers, steam cranes, all hooting deliriously, voiced their congratulations together with the human cheers of royalty, of high officials, and of all who could gather to celebrate Holland's triumphant victory after a thousand years of conflict with her invading enemy, the North Sea.

When completed, this enclosing dam was provided with room for a double track railway, a fine forty foot motor road with separate paths for cyclists and pedestrians. In this dam are twenty-five sluices with steel tidal gates, traveling up and down between reinforced concrete towers, closing at high tide to prevent salt waters from entering the lake and opening at low tide to permit the emptying of accumulated river waters. Spare gates are also provided for emergency. In this mass of concrete are built ship locks, to enable freight to go in and out through the North Sea.

The western portion of the ocean dyke was finished first to join the Island of Wieringen, then an inner dyke was completed to enclose the Wieringermeer "polder" of 48,000 acres. This basin was de-watered and de-salted and became the experimental area during the construction of the main ocean dyke. To empty these 48,000 acres of salt water, thirteen to sixteen feet in depth, the picturesque, efficient but slow Dutch windmill was discarded. Instead, two huge pumping stations, one driven by electric power with a capacity of 260,000 gallons per minute and the other (Continuing on page 78)



The ocean dyke — a man-made wall of defense between the new-born lands on the left and the new Yssel lake on the right. Dyked off the Zuider Zee, sea-water cannot now enter this lake and it will become a sweet water storage lake through the rivers which empty through it into the North Sea

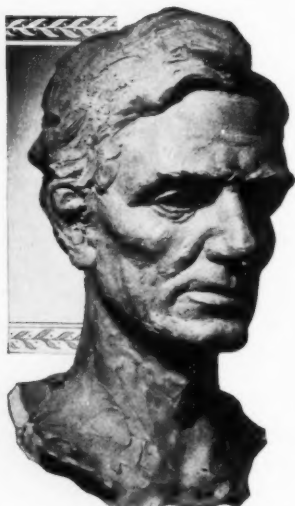
The ocean floor being plowed for the first time! It requires from two to three years for rains to leach out the salt from the clay soils but only one year from sandy soils — and the land is ready for the first crop



Harvests from the ocean floor! Not an African village, but the bountiful harvest of a farm on the floor of the North Sea only five years after the fishing industry was replaced by agriculture

A farmer and his family occupies one of the modern homes, with its huge model barn, in this "Holland-made Agricultural Heaven" — built to last for centuries. Four years after the North Sea was "pumped out" the landscape was dotted with such farm homes





WHEN LINCOLN WAS A BOY

By SAMUEL B. PETTENGILL

HAVE YOU ever been alone at night in primeval wilderness? There are not many places now where virgin timber stands untouched by ax or saw. One such place is Turkey Run State Park in Indiana. I was there one September. It told me something about Lincoln.

Toward midnight I went in the woods alone far from sight or sound of the nearest human being. A huge harvest moon in a cloudless sky sent long pencils of light down through the foliage of the forest. The gigantic tulip trees and sycamores stood in a hush of attention as if listening for the remotest whisper from earth or sky. They reached almost as high as an eight-story building before sending off their lowest branches. The massive trunks, glistening in the moonlight, seemed like the columns of some temple of the Egyptians where men worshipped forty centuries ago.

A curious sensation came over me. I felt my utter insignificance — the merest speck in space, and yet, with that feeling of littleness, another quite different. It seemed that I could reach up past that leafy ceiling to the quiet stars; that I could reach down through the cool earth to the roots of those Titans of the forest as they sought and found the sap of their sustenance.

The patience of the stars, the calmness of the sleeping earth, the massive strength of those mighty trees, the clean tang of the midnight air, — all these entered through some window I did not know I had.

And then, as I stood there, I thought of Lincoln when he was a little boy in Indiana six score years ago. It occurred to me, with a significance I had never realized, that when he was a lad it was primeval forest everywhere, not at Turkey Run alone; that every night when he was a little boy and everywhere when he was alone in the woods, he must have sensed those same impalpable presences; that what was to me an unforgettable hour was to him the constant companionship of all his impressionable years.

The friendliness of trees! We have lost something in this age of brick and steel and concrete. Not so in 1816. Trees made the flat boat that gave safe passage across the

Ohio to little Abe and his sister Sarah, to his father and Nancy Hanks. Trees made the "half-faced" cabin — open on one side to the bleak weather — where they spent their first Indiana winter. Trees fed the fire that gave them warmth, and lighted the pages of the Bible. Trees made for them their bed of leaves. Trees gave them the sugar of the maples, the brown nuts of autumn. Trees drove out the mosquitoes with their pungent log-fire smoke. Trees drove back the wolf and the panther with their glowing pine knots. Yes, and trees made for them crude chairs, tables, beds, ax-helves, ox-yokes, cradles, coffins. Little Abe with a whipsaw helped fashion one of these pioneer coffins. In its embrace a pioneer woman went "over Jordan."

Trees were friendly things.

"Such were a few of the many, many things the moon might have told little Abe Lincoln, going on eight, on a winter night on Little Pigeon Creek, in the Buckhorn Valley in Southern Indiana — a high quarter-moon with a white shine of thin frost on the long open spaces of the sky." You will find this in Carl Sandburg's "Prairie Years."

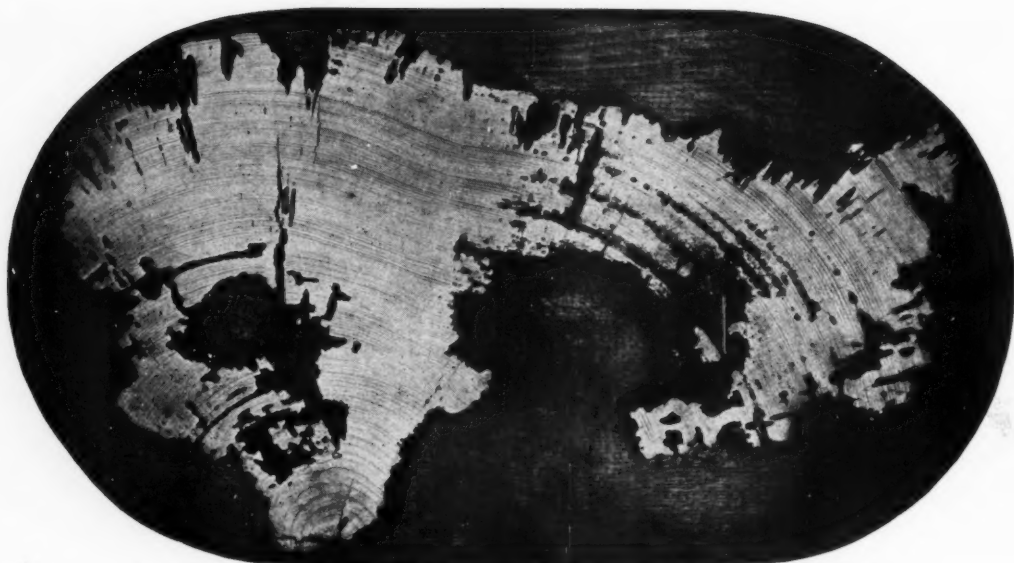
And then I thought of how little schooling the world has said Lincoln had — little Abe and Sister Sally tramping hand in hand over rough trails to school — four miles and back — eight miles a day. Not much schooling there for two little children.

But suddenly I felt less sorry for Abraham Lincoln. Everywhere he went were trees of the primeval forest — tulips, sycamores, oaks, elms, maples, beeches, walnuts. Everywhere that sense of peace, that feeling of being close to God. And I knew then that the statement in the books that Lincoln had little schooling was false, that he was at school many and many an hour when the boy of today is teacherless, learning the patience and the strength and the toughness and tenderness of trees, a lesson from the great Book of Life that never needs revision.

I understood better then the saying of the pioneers, — "The cowards never started and the weak never arrived." I understood the "railsplitter" better and America better in the big timber at Turkey Run.



THE TREES AT TURKEY RUN



A section from a decayed pine pilaster support from Kiva G, which carried the prehistoric climatic record back to 643 A.D.—almost 100 years farther than previously had been known

TREES DO NOT LIE!

Set Down Very Clearly in Their Accumulating Rings is A Continuous Record of the Years, from Ancient Times, Which a New Science Permits Man Today to Analyze and Translate

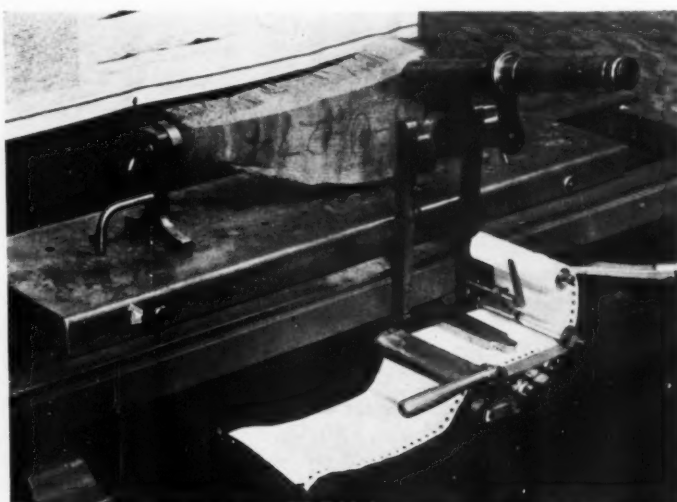
By FLORENCE M. HAWLEY and NEIL M. CLARK

THIS IS the story of an astronomer who looked down instead of up, to study the sun—and founded a new science. Dendrochronology, they call it; it is the science of analyzing tree growth-rings. The trees write their own clear records of the years and of late men have learned to read them far into the past. As more and more scholars are attracted to the field and more and more institutions undertake research, a wealth of new facts throw light on problems of climate, weather, entomology and the history of the human race.

The principle is simple though its detailed technique

is not. Trees grow well in favorable years, slowly in years of drought or other hardship. The swing from good years to bad traces a pattern—for instance three

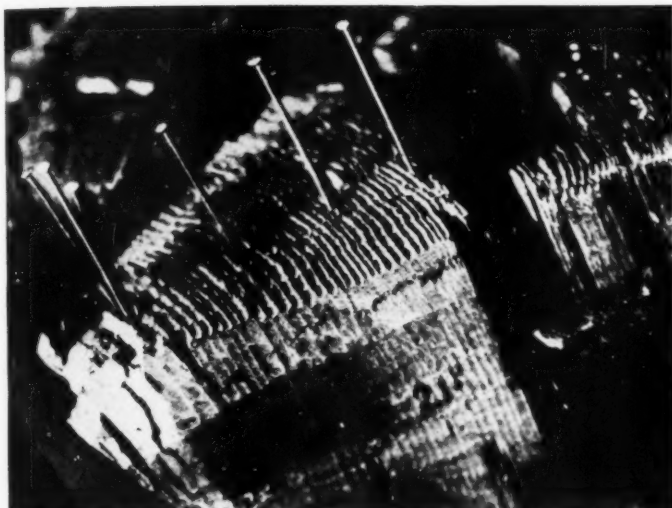
good years followed by three years of drought form three widely separated rings followed by three closely packed. This pattern will be the same in all the trees of that weather area. The date of the three year drought can be fixed by counting in from this year's ring of a growing tree. Say it was fifty years ago. Then somewhere an old timber is found—buried in a swamp, maybe. It has the pattern, but at its outer edge. Its



David B. Eisendrath, Jr.

This is the machine used in the Chicago laboratory to count and record tree ring growth automatically

AMERICAN FORESTS



Carnegie Institution of Washington

The center of the oldest Sequoia measured, dating 1300 B.C.
The three inner pins mark the 1305 B.C. ring growth

growth-rings inside the drought pattern carry the weather calendar further back, and reveal other characteristic patterns which can be matched in timbers even older, and so on. Here is the perfect, the indisputable, record of climate; here is a means of dating ancient traces of man, for example the Indian pueblos of the Southwest.

The sequoia calendar for the High Sierras goes back to 1305 B.C. The calendar of oaks in the middle west has been carried back to 1536 A. D. and will be traced further. The ponderosa pine calendar of the northwest goes back to 1268 A.D.

Most important conclusion of the new science amounts to a certainty. The trees say the same thing over and over: The climate of the United States is not changing.

Trees say that there has been no change in the amount of precipitation certainly for 650 years and probably for 2000 years. The trees record droughts centuries ago



N. M. Clark and J. Robert Jones

Walls of the Pueblo Bonito ruin in Chaco Canyon, as they appear today, with a projecting timber at the left center. Some of these old timbers are so well preserved in the dry air that resin oozes from the centers when they are cut for dendrochronological study. The insert above shows the ruin of an ancient kiva on the Chetro Kett pueblo site. Directly below the boy's figure may be seen an ancient protruding timber such as those used in Dr. Hawley's tree ring studies

that lasted longer and were drier than anything this generation has known, for all our dramatic dust storms. But the droughts were always followed by plentiful rainfall.

Pine beetles are most destructive in drought years. They killed billions of board feet of merchantable trees in the northwest and entomologists wondered if the forests were doomed. Would it ever rain again as it used to rain? Would nature herself eventually help fight the beetles? Rings of 1240 ponderosa pines were measured. A continuous tree ring calendar was charted for this area back to 1268 A.D.

There had been no general trend toward drier or wetter years over a 650-year period.

Likewise analysis of spruce dating back to 1434 A.D., sixty years before Columbus sailed, shows that the climate of Alaska has not changed.

The popular notion that the drought-rainfall cycle is regular is exploded by the tree-ring calendar. There is no seven-year cycle; there is no regularity at all, but there is an unceasing irregular rhythm.

Another conclusion plainly written by the trees is that we have, not weather, but weathers in the United States. The dendrochronologists are mapping these distinct regions in which the weather is the same. They have gone far enough to be able to say that a drought affecting all parts of the country at once probably never has occurred, probably never will.

Picking from their studies at random: There was a drought in the middle west in 1675, but it was very wet in the northwest that year and about normal in the southwest. Just before the Revolution, 1772-1774, the middle west was parched again and the northwest was rather dry, but two of these three years were splendid growing years in the southwest.

Father of the science of dendrochronology is Andrew Ellicot Douglass, Vermont-born, but transplanted to the University of Arizona. He is white-haired, seventy-two; technically he is retired, but that doesn't mean a thing; he works harder than ever.

In 1901 Douglass was driving through the Coconino forest, near Flagstaff. His mind was not on the horse or buckboard, but was 90,000,000 miles away. Literally. He was thinking about sunspots, his astronomical specialty. He was wishing there were records that went back ten or twenty centuries. Men had no such records, but—was it possible they were in existence in unsuspected form somewhere on earth? His eye fell on a big red-barked pine, and he had a hunch:

"Why not ask the trees?"

Steps in his reasoning seem simple when put down in black and white. Sunspots affect the earth's weather. Weather affects plant growth. Trees are the oldest living plants.

The astronomer abruptly cracked the whip and set the horse jogging toward the nearest sawmill.

But he found that trees do not tell their secrets without a struggle. It was three years before he discovered the principle which was to make a science of what might have been just a bright idea. He was measuring ring widths on five trees freshly cut near Flagstaff. Twenty-one years in from the bark, indicating the year 1883, he found the first of a group of small rings. On a weathered stump, Douglass recognized the same rings; but here they were only 11 years in from the bark. This, he reasoned, indicated that the tree had been cut in 1894. Nice detective work, if true. The owner of that stump was found.

"When," he was asked, "did you log that tract?"

He answered, "In 1894."

Thus was discovered the principle of cross-dating. But it was years before its universality and importance were realized.

Indeed, at one time Douglass himself was about to give up. He had sat under the lamp for a thousand nights peering through a magnifying glass at tens of thousands of tree rings. People had laughed at him for it; he was beginning to think they were right. For he had run up against something that looked unbeatable. To be sure, he had found frequent evidence of the sunspot cycle. But in one long period, from 1650 to 1725, such evidence was completely missing. What was to be made of that?

Then Dr. E. Walter Maunder, eminent English astronomer, discovered by other research that there were no sunspots in that period.

Here was corroboration. The fact that almost had made Douglass give up tree rings, proved their worth as historians!

Some trees tell their story better than others. Pines are best. Oaks in the middle west are excellent, but rather hard to read. Sycamores and cedars are first-rate. Trees like the hickory and walnut write legible stories, but there aren't enough of them for the necessary check and double-check over big areas. Cottonwoods, generally speaking, are no good at all. Any tree that grows near a never-failing ample water supply, tells very little; life is too easy for it; its rings are all alike.

Giant sequoias of California have seen thirty centuries and are still going strong. But a 400-year-old oak in the Ozarks is a Methusaleh. Living cedars have been found in eastern Tennessee which started growing in the 1300's, before Columbus was born. Pines in the northwest get to be six or seven hundred years old. But even half a dozen centuries are too few. Dendrochronologists hunt for older trees, dead but preserved one way or another with rings intact. These give the oldest dates.

The Douglass search for specimens of wood to carry the tree-ring calendar of the southwest into the distant past is one of the successful mystery hunts of modern science. A modern chronology, or calendar, had been worked back to 1260. Ancient wood had been used to build an entirely different chronology, which did not cross-date with modern trees. Could the gap be bridged?

In the ruins there of an ancient pueblo, Douglass found numerous pottery fragments, and one charred log which almost fell to pieces when he tried to move it. He bound it carefully with cotton twine, carried it away and studied it. The log bridged the gap, solved the mystery. It could be dated by the modern chronology, for it showed rings of the years 1237 to 1380. And its earlier rings also cross-dated with the floating chronology. That put dates on the floating chronology. Douglass calls the log the Rosetta Stone of southwestern archaeology, because it firmly dated the pueblo civilization.

Trees tell the history of whole tribes.

If you turn off of Highway 66 in New Mexico at Tiny Thoreau, and have luck with rain and roads, you will come after seventy-odd miles to desolate Chaco Canyon, windswept, treeless, grotesquely sculptured by wind and sand. You will drive for miles in this country and never meet a human being, unless perhaps a Navajo rider with braided hair. No place for farming. Hardly enough grass for grazing. Yet the lonely Chaco once was probably the most populous area within our borders. Vast ruined pueblos, nearly three dozen of them, suggest that at one time not less than 100,000 people may have lived here.

That was ages ago. Wasn't (*Continuing on page 95*)

COLORADO GARNERS HER BEAVER

By

ARTHUR HAWTHORNE CARHART



A beaver "kit"—live caught and transplanted in Colorado's plan for putting her beaver resource to work

A CENTURY ago the fur business that had lured frontiersmen into the Rockies was dipping toward oblivion. Pack trains of beaver hides were crossing the plains toward Saint Louis in diminishing numbers. Trapping rendezvous were disappearing and trading posts were being abandoned. Not only the annual crop of beaver, but most of the breeding stock had been taken from the streams. In increasing numbers the mountain men were moving on.

Twenty-five to fifty years ago, Colorado's beaver resource was practically exhausted. Then with protection, beaver began to come back. Today an old mountain man would be surprised if he could return. The beaver population of Colorado now is placed at more than 85,000. The Federal Forest Service estimates 48,000 beavers in the streams within the National Forests; there are as many more in other streams of the State. Only Minnesota has a comparable number of beavers.

But the greater surprise to the old mountain men would be Colorado's plan for putting her beaver resource to work. Two years ago, the state placed her wildlife resources under the management of a seven-man commission. One of the first steps taken was to recognize the beaver as one of the state's most valuable wildlife assets. A state trapper service was created. Since it began operations, fifteen trappers have transplanted alive some three thousand beavers from trouble spots in lower ranch territory to higher elevations where little damage can be done.

Beavers have an annoying inclination to set up house-keeping in irrigation systems. They dig canals and brush out tote roads through hay meadows. They some-

times flood pastures, and headgates on irrigation ditches are an invitation to start dam building at the particular spot. The first line task of the trapper service is to remove nuisance beavers and when possible, liberate them in headwater streams.

In early stages of this work, each trapper made his live transplants from day to day. Then the National Wildlife Restoration law—the Pittman-Robertson Act—opened the way for Colorado's Game and Fish Commission to undertake research so vitally needed as a foundation for game management plans. The second wildlife study project initiated was a state-wide beaver survey preliminary to plans which contemplated long range planting schedules and "farming" the entire beaver resource of Colorado on a systematic basis. Probably there is no more vivid illustration of the new approach to wildlife than this survey and the broad objectives and benefits it envisions. A clear outline of the work illustrates what is happening in other states where game and fish departments are working under the general mentorship of the U. S. Biological Survey as the national coordinating and directional head of the Wildlife Restoration Act.

Water is wealth in the West. A group of important rivers rise in the Middle Rockies. They are the Platte, the Arkansas, the Rio Grande and the Colorado. Millions have been and are being spent in dam construction to impound the flow in these rivers. The man-made structures are massive and costly, and generally so upset normal water levels in the streams that fishing is damaged or destroyed. A survey has shown that tourists brought eighty-three million dollars into Colorado last season. Another survey established the fact that every

third vacationing visitor comes to fish. Anything so drastically affecting fishing as these man-dams is of some economic import.

Beavers may not know the coefficient of materials, and other technical factors on which hydraulic engineers feed daily, but they know how to build dams and hold back water in high basins; incidentally, they improve fishing streams. So one of the objectives of Colorado's beaver plan is putting the big-toothed dam builders to work in high country constructing myriads of small impounding basins that will hold water. One colony averaging four to eight beavers will build one master dam and a series of supplementary catch basins above and below the main

gents increased his irrigated land from a small garden to forty acres after beavers had built dams in the stream on his property. A water commissioner on the Cimarron River estimates that his district gets twice as much water in August as it did before beavers threw a network of ponds over the upper basins of that stream. No exact data is available to prove that the flow of a stream will increase as a result of beaver dams at its head, but these reports must be given credence.

There are other benefits accruing to irrigation. The beaver dam not only holds back spring run-off, allowing it to feed down gradually, but it catches silt otherwise carried into reservoirs and canals. Silt can destroy the



Construction work by the busy beavers—this is one of two "master" dams and forty-two supplementary dams which a survey revealed in one mile on a small creek!

structure; sometimes as many as twenty dams in such a series. With 85,000 beavers already at work, the Colorado Rockies are being dotted with retaining basins holding millions of gallons of water—and doing this without benefit of transit, slide rule, or blueprints.

The retention of water at stream heads, where it will be released in regulated flow, is the first objective of the beaver plan. Water in the hills is money in the pockets of ranchers down stream.

At Paconia, Colorado, fruit crops worth tens of thousands of dollars have been saved by cutting beaver dams at critical periods and releasing impounded water. The animals repair the dams, the ponds fill again, and more water is caught for further use. A rancher near Sar-

efficiency of irrigation works. One look at an old beaver dam, filled to the lip with sediment, is quick proof of how these structures hold back destructive silt. Beaver dams on headwaters catch and retard the run-off of flash floods. They are a flood protection system in the mountains.

The beaver builders benefit trout fishing. In Michigan and the Adirondacks, beaver ponds have been accused of being detrimental to fishing. Impounded water is heated by the sun's rays and anything like seventy-five degrees Fahrenheit is critical for trout. Decaying vegetable matter in warm ponds creates gas which kills the fishes. And dams are said to obstruct trout running up stream to spawn.

A different set of conditions exists in the Rockies. The streams are snow-fed, always cold, and decomposition of organic matter is retarded. As timberline snow melts, as cutthroat and rainbow trout run to spawn, there is sufficient water pouring over a beaver dam to allow trout to climb the obstruction. Beaver work on mountain streams of the west does not adversely affect fish life as it may in more level country.

These ponds benefit trout fishing by making ideal nurse pools for small fishes. Willows growing at the margin give needed shade. In steep-walled canyons the ponds are narrow, with a constant circulation of fresh water through them. Meadowy growths on the banks are

values. A very conservative estimate of carrying capacity for beavers in Colorado's high streams sets the limit at 100,000 animals. Colonies in the "aspen belt" eat cottonwood, aspen, willow, and other growth classed as "forest weeds." In this higher elevation the beaver work will not become a nuisance; they are above the ranch zone.

A pair of beavers will have from two to six kits a year. Few are killed by predators. No serious diseases have affected them. If protected, beaver will increase more than one hundred per cent a year. Accepting that conservative estimate of carrying capacity, the annual crop of Colorado pelts may exceed 100,000 a season. Not only may this harvest be attained, but good wildlife



An objective of Colorado's beaver plan is to put the big-toothed dam builders to work constructing small impounding basins to hold back water. Six beaver are estimated to occupy this "live" pond

breeding places for insect life, food for trout. All reports of the effect of beaver ponds on high country streams of the Rockies point toward more benefit than detriment to trout.

In brief, Colorado is putting her beavers under management so water will be impounded, silt will be retained, irrigation benefited, flash floods will be checked at their source, a steadier water level will be maintained, range water will be available in areas of low rainfall, and fish carrying capacity of the streams will be raised. Add these together and the economic value of an optimum stocking of high streams with beaver colonies becomes evident.

But the community's return does not end with these

management will regulate populations so that they will not deplete food supplies.

The most serious problem in the beaver business is the "fur bootlegger." The "mountain mule skin racket" as it is called, is thoroughly organized. Those who know the inside workings of the gang report that the illegal trapper sells to the unscrupulous fur buyer, the hides are run over a state line, and given counterfeit metal tags made by a machine shop in a little western town. Under the spurious protection of the counterfeit tags, the hides are transported to one of several "hot fur" houses in the Middle West, sorted there, and the best hides are given new counterfeit tags, supposedly authentic Canadian seals. Canadian (*Continuing on page 89*)



F. A. SILCOX

DEATH late in December robbed the conservation world of two of its ablest leaders. On December 20, at his home in Alexandria, Virginia, F. A. Silcox, chief of the United States Forest Service since 1933, died following a heart attack. Eleven days later, at Walter Reed Hospital in Washington, D. C., Robert Fechner, director of



ROBERT FECHNER

DEATH CLAIMS F. A. SILCOX AND ROBERT FECHNER

the Civilian Conservation Corps since its inception in 1933, died after a lengthy illness. At the time of going to press, the important posts vacated by the death of the two leaders had not been filled by the President.

"The death of Mr. Silcox is a blow to the whole American movement for conservation of human and natural resources," said Secretary of Agriculture Henry A. Wallace. "As this news reaches them, the legion of men and women at work on all the many fronts of this movement to save and use wisely our abundance of man power and the physical resources feel a sense of personal loss, and of loss for the cause of developing a better American civilization. Mr. Silcox's wide-ranging intelligence, inspirational leadership and great energy were devoted with complete selflessness to the public service in a score of ways aside from his extremely competent administration of the Forest Service. His work is commemorated in a government organization of highest efficiency and *esprit de corps*—and in the grateful remembrance of great service to many of the worthy civic enterprises that American citizens are carrying on today."

Mr. Silcox became chief of the Forest Service on November 15, 1933, following the death of Robert Y. Stuart. He came to the position with an outstanding record of service in forestry and in industrial relations, and an intense and devoted interest in forest conservation, especially in its relation to human welfare.

Entering the Service in 1905 as a forest assistant, he rose through the various ranks and in 1910 became regional forester of the Northern Rocky Mountain National Forest Region. Shortly after the outbreak of the World War, he was given military leave to accept a commission as Major in the 20th Engineers. Following this service he was assigned by the Secretary of Labor to straighten out labor difficulties on the West Coast. From that time on until his appointment as Chief Forester he gave his energies to industrial relations.

Born in Columbus, Georgia, in 1882, Mr. Silcox was a graduate of the Yale Forest School.

President Roosevelt led the nation in mourning the loss of Robert Fechner, Director of the CCC. Under his guidance more than \$2,000,000,000 in federal funds were used to rehabilitate nearly 2,400,000 depression-idle youths working in the forests and parks of the country.

"As director of the Civilian Conservation Corps," said the President, "he brought to the public service a great administrative ability, vision and indefatigable industry. His death is a loss to the CCC and to the nation."

Mr. Fechner, internationally known as a labor leader before being called into government service by President Roosevelt in 1933, had been in ill health for more than a year. Active in a number of the President's advisory groups, his death removes a man considered one of the most capable administrators in the government.

Born in 1876 in Chattanooga, Tennessee, Mr. Fechner was recognized as an authority on labor and industrial management, and as early as 1921 he was called upon by Harvard University, Dartmouth College and other nationally known educational institutions to give lecture courses. He had been vice-president of the International Association of Machinists.

EDITORIAL



TWO LEADERS PASS

IN THE deaths of F. A. Silcox, Chief of the Forest Service, and Robert Fechner, Director of the Civilian Conservation Corps, conservation has lost two men whose names will long remain inspiring symbols of public service. Both men died prematurely and in so doing, it rightly may be said, they sacrificed their lives to the public undertakings whose responsibilities rested upon their shoulders. Had they been less conscientious, less sparing of themselves in unrelenting toil and service, less intensely devoted to the causes for which their undertakings stood, death so early may not have overtaken them.

As head of the Forest Service for six years, Mr. Silcox vitalized not only his own organization but the whole forestry movement with a keenness of mind and a breadth of vision that were contagious and often startling. Imaginative and idealistic in a high degree, he was at the same time a realist who rebelled at the static in public and private places. If his vision and ideas sometimes went beyond the reach of those with whom he came in contact, they none the less left in their wake mental stimulation and outlines of new horizons. Just to talk to him was to be lifted out of grooved thinking. He sought desperately to shake ingrownness and bureaucracy from his own service and entrenched practices of destructive lumbering from private industry. Lumbermen by no means always agreed with him but they always respected him because he expressed his views with fearless and outspoken clarity.

In thorough sympathy with the social objectives of the New Deal, Mr. Silcox was its outstanding exponent in conservation. Figuratively, he saw trees in terms of people and as instruments for improving the lot of mankind through wise use. Human problems were his abiding stimulation — an intense, driving force within him that he could not have quelled even had he so wished. To him forestry was more a human than a tree problem; it was a means to an end and that end was the betterment of social conditions. His purposeful enthusiasm, engaging personality and unshakable poise combined to lift forestry from its heavy and to many its uninteresting plane of technical routine and to make it sparkle with human beings and human objectives. Here, we think, he leaves his deepest and most lasting imprint upon the

Forest Service and upon forestry in general. And that as one of his own men expressed it, is a "forward impelling tradition."

Robert Fechner was a different but none the less effective type of leader. Quiet sincerity of purpose, indefatigable devotion to his work and lofty conception of public service were his outstanding characteristics. Un-schooled in conservation, he answered the call to lead the nation's greatest conservation undertaking—the Civilian Conservation Corps. How well he has fulfilled the trust is written across the land from coast to coast in conservation works that would take a whole volume to list. And by the same token, it is written into the lives of millions of boys to whom the Corps has been a saving refuge in times of adversity. Mr. Fechner lived for the Corps and gave it a quiet and untiring devotion that is unmatched in recent public service.

Like Mr. Silcox he saw in his work a public trust in terms of human beings. In his case, they were boys—American youth for whom the CCC might be a stepping-stone to better lives and self-supporting citizenship. In an article in this magazine last year, he wrote: "I am hopeful that as time passes we can do even more than we are doing today to assist youth to become self-supporting. I am not a believer in coddling youngsters and so long as I am director I intend to do everything I can to help young men develop self-reliance and pride in their ability to make their own way in the world. I want enrollees to have every possible educational and training opportunity that can be given them without sacrificing the CCC work program. I have never been in favor of shortening the work week of forty hours to provide additional time for schooling, as I believe young men obtaining their first work experience should learn at the beginning that they must do an honest day's work and do it every day when they are employed if they are to be worth their salt."

Mr. Fechner's public career, though it covered only seven years, will long stand for a great and difficult undertaking well and humanly generated. And to those who knew him, Robert Fechner will long live as an inspiring example of sincerity, trustworthiness and earnestness of purpose in public service.





This is the Roberts Plot at Urania — started in 1915 it was the first forest experimental plot established in the South. Fenced against hogs, it has never been burned or thinned. Truly a monument to the man who conceived the project described here

Arthur W. Nelson, Jr., and Lloyd P. Blackwell

MONUMENTS THAT GROW

By

SAM MIMS

FREQUENTLY the man or woman who advocates new and untried methods is scornfully described as a "visionary." It is unfortunate that the so-called dreamer and the practical man cannot find a common ground where a "meeting of minds" may be held. However, the history of outstanding men and women records that in spite of these seemingly opposing forces there are rare instances of both visionary and analytical proclivities functioning harmoniously in the same brain. Ordinarily the practical man is content to follow in the footsteps of those who have gone before, or he takes facts and figures that his predecessors have found workable and by methods of deduction charts his course. Not so with the dreamers.

Henry E. Hardtner was a practical and successful business man, and yet there lurked within his alert brain an unobscured vision. The vast area of denuded forest lands in central Louisiana presented an ugly picture to his far-seeing eyes. *Devastation, destruction*, were not comforting words to him, particularly since he was en-

gaged in timber and lumber operations. He didn't want acres, thousands of acres, of charred stumps to stand as tombs to commemorate his memory as a sawmill man. But more intently was he thinking of the generations that would follow him.

Born and reared in Pineville, Louisiana, and having made his fortune from the natural resources of his native state, he had no ear for the call to other lands. Although he traveled extensively, he had "cast his bucket down" in the locality in which he had been reared. He had no wish to move on to greener timbers. All of his life he had communed with nature and marveled at her handiwork. He had indomitable faith in her power. If the hand of man did not completely despoil her she would assert her magical powers and replenish her gardens.

When Henry Hardtner began preaching the gospel of restoration and reforestation, his friends and neighbors laughed at him, and even the experts in far-away places scorned his admonitions, save and except one man who



In the Violet Urania Forest on the lands of the Urania Lumber Company — loblolly and shortleaf pine, seeded in on cutover longleaf pine land. The stand was thinned severely at twenty-three years of age, in 1924, and the crown cover opened about fifty per cent, since which time diameter growth has increased and the crowns have extended their area

occupied a very high place. That man was President Theodore Roosevelt, who had been greatly impressed by the earnest warnings of such men as Hardtner, Graves and Pinchot.

During the year 1908 President Roosevelt caused to be held in Washington the first national conservation

meeting. He had sent out a call to the governors of every state in the Union to attend a conference to discuss ways and means of restoring forests that were being ruthlessly destroyed, and to devise plans of cutting and logging trees that would not render nature helpless to replenish her forest lands.

Henry Hardtner suffered no gibes at this great meeting. He had found another dreamer. The President of the United States also had visions. Returning to Louisiana, with renewed courage and determination, he began experiments with timber growing. With malice toward no one he resolved to accept with jovial spirit the laughs that would resound among his neighbors when he advanced the theory that hogs were the worst enemies to be encountered in the growing of longleaf pines.

Many years ago he had learned that longleaf pines have a long, succulent taproot, covered with luscious bark that is very pleasing to the taste glands of a piney-woods rooter. He had seen these thrifty animals, that are constantly searching for food in the forests, burrow their snouts into the ground, uproot young longleaf saplings, and chew hungrily upon the taproot. He had observed that other young trees, even the loblolly and short leaf pines were not disturbed by these ravenous swine.

Every lumberman, every practical forester, every native he had talked to about growing longleaf timber had contended that this peculiar tree would not reproduce itself. Various theories had been advanced in attempts to prove to Hardtner that he would be undertaking the impossible, but none of them seemed plausible to this determined man. However, there was one question that disturbed him: "Have you ever seen young longleaf saplings growing on cut-over land?" "No" would be the correct answer. There was one man who had profound faith in Henry Hardtner, and that was his brother, Quintin. These two men were officers in the Urania Lumber Company, with Henry as president and manager. This sawmill company had started operations in 1896 after having purchased 75,000 acres of virgin timber. The forty people who constituted the population of the new town of Urania lived for a number of years in ten improvised shacks, with the officers of the company occupying one of them as living quarters and for the transaction of all business.

By 1908 the company-owned town and the sawmill had grown to considerable proportions, so it was not an im-

provised shack to which Henry Hardtner returned after his visit to Washington and his contact with men who were definitely and earnestly concerned in the problems of reforestation. Exultant over the enthusiasm with which the President of the United States had accepted his plan of preserving and restoring trees, Mr. Hardtner thoroughly inoculated his brother Quintin with the plan of handling their vast acreage in such a way that the Urania Lumber Company would have a perpetual supply of timber. At the same time they would prove to lumbermen that to slaughter their forests was to kill the

goose that laid the golden egg.

In 1913 Henry Hardtner placed a hog-proof fence around a plot of ground upon which were growing three longleaf seed trees. The following year the people of the neighborhood were amazed to see this enclosed plot covered with healthy, vigorous, young longleaf plants, which today stand as monuments, as do thousands of other trees, to the man who is now known as "The Father of Reforestation." They are even more impressive than the bronze slab donated by The Society of American Foresters to the fifteen hundred inhabitants of Urania as evidence of high regard for a man with vision. These thousands of acres of stately trees commemorate the life of this man, and seem constantly to chant a requiem for his untimely death, which occurred on August 7, 1935.

In the fall of 1928, Mr. Hardtner enclosed within hog-proof fence a tract of fifteen hundred acres of timberland to be called the "Herman H. Chapman Forest." This gesture must have sprung from a realization that his vision had become a superb panorama and his dreams a reality. Whatever may have been his thoughts, it is obvious that he felt very kindly toward the man for whom he had named this portion of his one hundred and ten thousand acres of timberland. He must have found a kindred spirit in Prof. Chapman who, during the spring of 1917, brought his forestry class of Yale College to Urania to get practical knowledge of reforestation. Annually, since that year, these classes have come (*Continuing on page 93*)



Called the "Father of Reforestation" in the South, Henry E. Hardtner said: "When the old trees are cut down, I will plant young ones — I will lay the foundation for a new forest to replace the old . . ." And he lived his dream into reality. This is the bronze memorial tablet erected to his memory in the park at Urania, Louisiana



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Holland Builds a Masterpiece

(Continued from page 62)

with Diesel engine power with a capacity of 120,000 gallons per minute, using different fuels as a precautionary measure, sucked up the 48,000 acres of salt water and dumped it back into the North Sea in a record breaking time of six and a half months.

Now, onto this new "polder" came a marvelous synchronization and coordination of engineers, agricultural specialists, such as soil scientists, foresters, architects, builders, contractors, masons, town planning experts, transportation engineers; in fact, every kind of specialist needed suddenly to bring forth from blue prints, new towns, producing housing conditions such as one would expect one hundred years hence, and ultra modern farms and barns to make a farmer's fondest dreams come true.

Before this first vast basin of water was entirely emptied power machinery, built for this purpose, had marked off with mathematical precision, each new farm in elongated sizes from fifty to 160 acres according to land use, as prescribed by the sampling of soil scientists, who had laid off dairy ranches, truck gardens, grain farms, sugar beet farms, communal forests, all according to the character of the "soils" of the ocean floor. No fences or boundaries were necessary because drainage ditches or moats separate each farm on the long sides. Barge canals bound each farm on the narrow rear end and connect with the large freight transportation canals to the ocean or up the

lake. All the material scooped up from these channels had been dumped on specified lines to form a network of elevated paved roads, with hidden electric and telephone wires, which radiated out from the commercial centers to electrify every farm and to form the boundary at the opposite end from the barge canal, thus giving complete water and motor transportation facilities for every farm.

This new army of occupation divided itself into units. A division of masons constructed concrete movable bridges over the large canals and stationary bridges over the barge canals in connection with

these excellent elevated paved roads. Architects, carpenters and masons, combined their best efforts to build huge, ultra modern barns, architecturally a part of the house, of materials and design to last for centuries. Besides electricity and telephones for each home, small wells were dug into the peat and sealed to accumulate marsh gas, which was piped to kitchens for cooking purposes. The only deficiency from our viewpoint was that bathroom equipment was left for individual farmers to install when and if they wished, instead of being a part of the initial building plan. Homes were always placed at some distance from the road to allow for the beautiful flower gardens for which the Dutch are far-famed.

Meantime, armies of architects, masons, carpenters, plasterers, attacked the problem of erecting the blue print model, full grown towns, with homes and hotels, schools and churches, recreation and business buildings, all of harmonious designs, in delightful combinations of brick, tile and window panes, making buildings fairly radiant with light and air. Nothing was crowded, all homes had their gardens, and happy generations to come will thank these ancestors for providing ample parking space for future automobiles, regardless of size and number.

The building programs were simple compared with the task confronting the agricultural engineers. The "soil" of the ocean floor had the same salt content as the

(Continuing on page 91)

FORESTRY AND CONSERVATION HIGHLIGHTS IN THE 1941 BUDGET

Appropriation and Project	1941 Estimate	1940 Appropriation	Increase	Decrease
FOREST SERVICE	\$18,648,225	\$20,294,466		\$1,646,241
National Forest Administration	12,120,485	12,004,000	\$116,485	
Forest Fire Prevention	3,261,988	3,318,885		56,897
Forest Fire Suppression	250,896	254,881		3,985
Forest Insects	131,702	134,632		2,930
Blister Rust Control	935,287	735,287	200,000	
Reforestation	236,543	240,301		3,758
Nurseries and Planting Stock	213,352	216,742		3,390
Hazard Reduction—White Mountain National Forest	100,000	437,769		337,769
Private Forestry Cooperation	100,000	100,000		
Forest Management Research	607,900	643,403		35,503
Range Investigations	230,900	245,935		15,035
Forest Products Laboratory	668,200	664,181	4,019	
Forest Survey	250,000	250,000		
Forest Economics Investigations	140,900	149,295		8,395
Forest Influences Investigations	135,400	139,152		3,752
Forest Fire Cooperation	2,200,540	2,200,000	540	
New England Hurricane Damage	300,000		300,000	
Distribution of Planting Stock	100,000	100,000		
Acquisition of Forest Lands	1,000,000	3,000,000		2,000,000
SOIL CONSERVATION SERVICE	20,195,128	23,720,584		3,525,456
MISCELLANEOUS				
Cooperative Farm Forestry	300,756	300,000	756	
Farm Forestry Extension	78,098	77,898	200	
Dutch Elm Disease Eradication	501,500	500,000	1,500	
White Pine Blister Rust Control	403,570	300,000	103,570	
Gypsy and Brown-tail Moth Control	379,640	375,000	4,640	
Forest Insects—Studies and Control	255,540	253,100	2,440	
Diseases of Forest Trees	230,760	265,392		34,632
National Arboretum	54,587	54,587		
Naval Stores Investigations	96,600	89,400	7,200	
Forest Fire Weather Service	81,500	56,000	25,500	
Forest Fire Weather Investigations	3,930	3,930		
TOTAL TO DEPT. OF AGRICULTURE	41,229,834	46,290,357		5,060,523
BIOLOGICAL SURVEY	5,863,293	4,931,214	932,079	
NATIONAL PARK SERVICE	4,900,790	4,610,022	290,768	
BUREAU OF FISHERIES	2,171,360	2,259,400		88,040
GRAZING SERVICE	1,000,000	1,000,000		
O. & C. LANDS	150,000	150,000		
PREVENTION OF FIRES IN ALASKA	27,000	37,500		10,500
ADMINISTRATION AND PROTECTION OF INDIAN FORESTS	572,520	476,500	96,020	
TOTAL TO DEPT. OF THE INTERIOR	14,684,963	13,464,636	1,220,327	
CIVILIAN CONSERVATION CORPS	230,000,000	294,955,000		64,955,000
GENERAL PUBLIC WORKS PROGRAM				
Forest Roads and Trails	10,000,000	10,000,000		
National Park Roads and Trails	2,000,000	3,500,000		1,500,000
Blue Ridge-Natchez Trace Parkways	2,000,000	4,500,000		2,500,000
Repair of National Park Buildings	165,750		165,750	
TENNESSEE VALLEY AUTHORITY				
Forestry, Wildlife and Recreational Development	429,000	434,000		5,000
GRAND TOTAL	\$300,509,547	\$373,143,993		72,634,446

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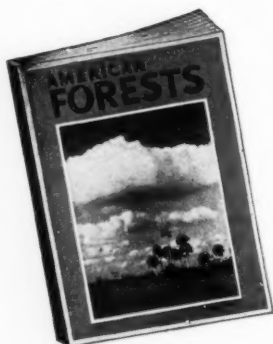
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- Prevention of Soil Erosion
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Western Forestry Association Stresses Forest Needs

THE Western Forestry and Conservation Association's meeting in Portland, Oregon, December 14-16, wrote into its resolutions a warning that unless present barriers to better forest practices are removed and more adequate funds are provided for forest protection, the entire forest policy will be doomed to stagnation and failure. "These requirements are no longer debatable," it asserts. "All federal, state, county and private agencies intimately connected with forest management are in agreement on the urgencies of these needs."

Specifically the protection measures needed as the basis of a successful forest program, the resolution states are: (1) Protection of the forests from fires must be provided on a scale where even abnormally bad fire seasons will no longer threaten the security of mature timber and reforesting lands, and (2) Protection of the forests from insects and diseases must be provided immediately.

Continuing, the resolution declares that progress in removing present barriers to improved forest practices will be obtained by adoption of the following measures: (1) Adoption of the McNary-Doxey Bill; (2) Proper appropriations for the Fulmer Act; (3) Passage of the Lea Blister Rust Control Bill; (4) Amending the

Clarke-McNary Act to provide that federal allotments to states be increased to fifty per cent based on performance; (5) Development of greater markets for forest products not now used; (6) Changing those tariff and import-export regulations that are depriving our forest products of markets formerly enjoyed; (7) Exempting fire fighting from the provisions of the wage and hour laws; (8) Improving,

extending, and localizing fire weather forecasts; (9) Further development of knowledge through research, especially in wood utilization studies by the Forest Products Laboratory, studies in forest management by the Forest Experiment Stations and the rapid completion of the forest survey, and (10) Adjusting private forest land taxation to meet the ability of forest lands to support government, and adjust federal and state payments to local governments in lieu of taxes on publicly owned lands.



E. T. ALLEN

Whose forty years of service to forestry was honored by the Western Forestry and Conservation Association at a Testimonial Dinner in December

Officers of the Association elected for the ensuing year are G. F. Jewett, Spokane, president; W. C. Lubrecht, Bonner, Montana; S. G. Moon, Boise, Idaho; C. B. Sanderson, Seattle; E. S. Collins, Portland; and C. B. McLeod, San Francisco, vice-presidents; E. T. Allen, forest counsel, and C. S. Chapman, secretary-treasurer.

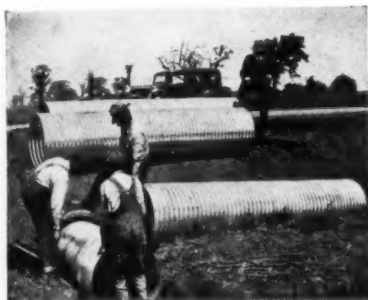
Graves to Study South's Educational Needs

ANNOUNCEMENT has been made that Henry S. Graves, Dean Emeritus of the Yale School of Forestry, has accepted an assignment from the General Education Board of New York to make an extended investigation of the problems of education and research in forestry in the southern states. The purpose is to study present educational and research activities by different agencies, in order to determine possible measures for their further development and improvement. The project is based on the belief that education and research constitute one of the most effective means to advance forestry in the South and thereby to secure the benefits of well

managed forests in improving and maintaining the economic and social conditions of rural communities. The study will by no means be confined to activities of colleges and universities but will include possible contributions by schools of all levels and extra-school agencies.

Mr. Graves will be assisted by Hillis L. Howie, of Indianapolis, who is completing his work for the Ph.D. degree in the Yale School of Graduate Studies. Mr. Howie is specially well qualified to participate in the investigation through his knowledge of educational problems, background of science, and experience as a teacher.

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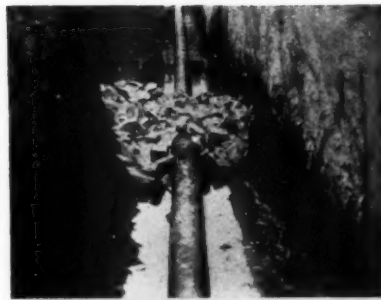
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• Here's a quick reference to seven Armco products that are saving time and money for thousands of roadbuilders from coast to coast. On this page you'll find a thrifty structure for every problem in drainage or earth control. And remember, with each one you are assured of sound engineering design and expert craftsmanship developed through 33 years of Armco research.

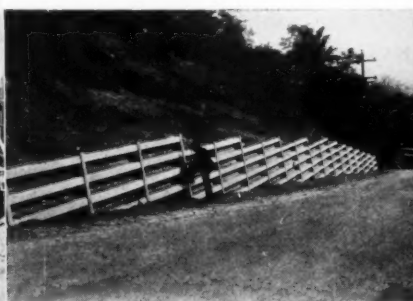
Besides helping you solve your problems faster and at less expense, Armco products give you top performance without maintenance. This is because they are made of galvanized ARMCO Ingot Iron—the *only* low-cost metal proved by a third of a century of service under the roads. Write for literature. Armco Drainage Products Assn., Middletown, O.



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Rochester, N. Y., Dept. of Parks

YOUR SHADE TREES

PLANT TO ATTRACT THE BIRDS

The dogwood graces your garden with the beauty of a bride in spring and offers a feast of rich red berries to the birds in the fall

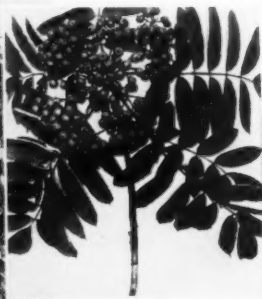
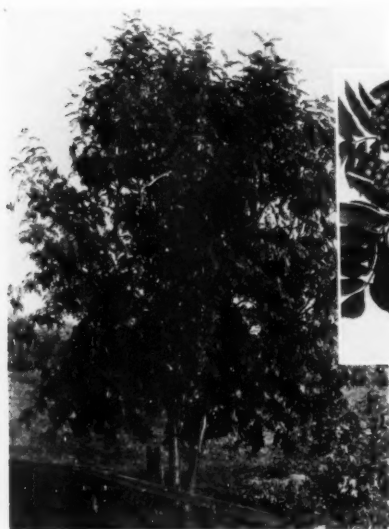
"What is more cheerful now, in the fall of the year, than an open wood-fire? Do you hear those little chirps and twitters coming out of that piece of apple-wood? Those are the ghosts of the robins and bluebirds that sang upon the bough when it was in blossom last Spring."

A lovely thought, but one need not be satisfied with just the ghosts of birds, no matter how cheerfully they chirp from the applewood blazing merrily on the hearth. One only needs *think* and *plan* when he plants. Supply the small feathered songsters with their favorite foods and they will come and live with you, in person—many of them, all the year round. What

is more beautiful than the flash of a cardinal's wings against the snow, as he seeks in your holly tree the scarlet berries that vie with his own coat for brilliance of color? And he *will* seek, if the holly tree is there. Garden and tree lovers must be bird lovers, too, so plant to attract them—as many of the cheery, feathered tribe as you can. It is not difficult to do, for while they are independent and almost wholly self-sufficient, there are times when life is a terrible struggle, even for these small brave ones. Times when the world is frozen over and they lean—with amazing confidence—on the bounty provided by their human friends.

Feeding the birds occasionally, or groups of them even regularly, is well

enough. And establishing feeding stations and providing shelters is excellent, but better far it is to plant such trees and shrubs as will afford them dependable food and shelter when "the North Wind doth blow" and little robin must "hide his head under his wing, poor thing." And he will surely have to do this, unless you have provided for him. Thick clumps of Japanese honeysuckle (*Lonicera japonica*)—which is almost evergreen—or summer grape (*Vitis aestivalis*)—both with profuse leafage, make a warm and perfect shelter from which he can defy the elements. And if you have planted there for further protection the Virginia creeper (*Parthenocissus quinquefolia*), and the catbriar (*Smilax glauca*), the cover is al-



The Mountain-ash (left) is ornamental in your garden and its berries delight the gentle cedar-waxwing, the Baltimore oriole, robins, grosbeaks and flickers; and the same birds and many more are lured by the blue berries of the Redcedar (right) the dense green foliage of which also offers them a warm refuge in stormy weather

most impenetrable for cats or other small predatory animals, though the birds can easily slip through and find sanctuary.

Then, the privacy so greatly to be desired in a garden is achieved where high, thick hedges are used. What could be more delightful for the birds than a hemlock or cedar evergreen apartment—cool in summer, warm in winter, even in the stormiest weather? And it is always to be hoped that such accommodations may entice them to become permanent tenants and you have then also secured a permanent working staff, for many of the birds that love to live in gardens are invaluable as insect and weed seed eradicators, and bring all the force of their intense little lives to these jobs. Nature's

(*Aronia*); Spicebush (*Benzoin*); Hackberry (*Celtis*); Dogwoods (*Cornus*); Hawthorn (*Crataegus*, vars.); Holly (*Ilex opaca*); Redcedar (*Juniperus virginiana*); Honeysuckle (*Lonicera*); Bayberry (*Myrica*); Mulberry (*Morus*); Tupelo (*Nyssa*); Sumacs (*Rhus*); Elder (*Sambucus*); Sassafras; Mountain-Ash (*Sorbus*); Black Cherry (*Prunus serotina*); Blackhaw (*Viburnum prunifolium*); Wild Grape (*Vitis*).

If you plan your planting so that the berries and fruits of these special trees and shrubs are spread before them, your garden will lure the bluebird, the bobwhite, the catbird and the chickadee. It will ring with the song of the cardinal, the meadowlark, the songsparrow and the



Half a hundred different birds delight in the purple-black fruit of the native wild black cherry (at the left) and the sumac and holly (center and right) are eagerly stripped in the spring by the bluebirds and robins. Thoughtfully plan your planting, and your garden will be a year-round mecca for the birds

extermination agents, what they accomplish is amazing. The figure given by the Department of Agriculture establishes the value of birds in destroying insects at over \$350,000,000 annually. A helpful individual, and one of the most beautiful of the birds, is the rose-breasted grosbeak. The list of garden pests he destroys is wondrous long and includes wood borers, moths, cucumber beetles, potato bugs, destructive caterpillars of all kinds and scale insects—a wide variety of diet. The brilliant-plumaged cardinal is another assiduous worker and will repay your hospitality not only by enjoying the wild fruits, of which he is so fond, but by eating many insect pests which are the despair of gardeners—notably cutworms, rose beetles, leaf-hoppers and plant lice.

Space limitations preclude giving complete descriptions or detailed lists of plants and shrubs for planting, as they are almost endless in number. It is well to consult nationally known nurserymen for information and advice. In the following group are some of the more desirable kinds to ensure the birds a plentiful table all around the year: Downy shadblow (*Amelanchier canadensis*); Virginia Creeper (*Amelopsis, quin.*); Chokeberry

warblers. You will hear the enchanting notes of the thrush's evening song, the rippling call of the wren and the musical vireo—and that strange, unearthly song:

"... the veery's vesper,
Sweet and clear,
As convent bells at eventide."

The list is long of the willing tribe of songsters, and here again we mention only a few. Fully and authoritatively the subject is covered in the new book, "Birds in the Garden," by Margaret McKenny, priced at \$5 and published by Reynal & Hitchcock, New York City. Or, a new bulletin being issued and distributed free by the Interior Department, Washington, D. C., as Conservation Bulletin 1, titled "Attracting the Birds," is very informing. Plan to attract the birds with the bright-colored and shining berries and fruits of the trees and shrubs they love best, both for their sakes and your own—for the quiet beauty they will bring into your heart. Your garden will cherish the loveliest ornamentals in spring and summer; in fall will glow with the most brilliant of colors; in winter offer its rich harvest of fruit and berries and you will have "singing birds all the year round."

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FORESTRY IN CONGRESS

By G. H. COLLINGWOOD

FOLLOWING the opening of Congress on January 3, and the Release of the Federal Budget on January 4, Chairman Cannon's subcommittee on Agricultural Appropriations opened public hearings, with the intention of submitting a bill to the House by February 1.

All federal phases of forestry and conservation for 1941 are budgeted in the amount of \$300,509,547 as compared with \$373,143,993 for the current fiscal year. This does not include the half billion dollars budgeted for conservation and land use activities by the Agricultural Adjustment Administration nor contemplated expenditures for emergency relief.

The Budget proposes to slash \$65,000,000 from the Civilian Conservation Corps. This would reduce the present number of camps from 1,500 to 1,227, and the average present enrollment from 281,005 to 229,555. The permanent field personnel would be reduced from 31,312 to 27,038 persons.

Forest Service

A proposed Forest Service cut of \$1,646,241 would bring its appropriation from \$20,294,466 to \$18,648,225. National Forest acquisition, with \$1,000,000 budgeted, would be reduced by \$2,000,000. Representative Eugene B. Crowe, of Indiana, has headed a movement to restore the full \$3,000,000 for land purchases, and has also introduced H. R. 7541 to appropriate \$15,000,000 for this purpose during the coming fiscal year.

The several forest research items are reduced by a total of \$58,666 with the Forest Experiment Stations as listed under "Forest Management Research" taking the major reduction of \$35,503. An increase of \$4,019 to the Forest Products Laboratory would give that institution a total of \$668,200, while the forest survey having attained its statutory limitation remains at \$250,000. An increase of \$540 to bring forest fire cooperation under the Clarke-McNary Law to \$2,200,540 appears to be absorbed in increased administrative costs. There is a new item of \$300,000 to be expended by the state foresters for reduction of hurricane damage in New England, with no announced plans for supplementary appropriations. This indicates the probability of liquidation of Forest Service activities in that region beginning July 1.

White pine blister rust control as administered by the Bureau of Entomology and Plant Quarantine would receive an increase of \$103,570 to bring the total to \$403,570 with \$200,000 added to the Forest Service budget to provide \$935,287 for control on national forests. The current year's appropriations are supplemented with emergency funds totaling \$1,252,509

to which some two to four per cent additional is allotted through the states for supervision. The Bureau of Entomology and Plant Quarantine increase is scheduled to provide thirty-four new technical positions.

Dutch Elm Disease

Dutch elm disease eradication is given a \$1,500 increase to make a total of \$501,500. The current appropriation has been supplemented with \$1,965,085 from emergency sources, of which \$40,000 or less than two per cent is available for technical supervision to supplement the regularly appropriated money. During public hearings on January 9, Chairman Cannon indicated his disapproval of appropriations for the present program.

The Soil Conservation Service reduction of \$3,525,456, bringing the total for the coming year to \$20,195,128, will reduce cooperation with 217 established soil conservation districts in twenty-six states, as well as additional districts now being formed in ten additional states. This directly affects 119,000,000 acres in a million farms, whose chief source of aid in the land adjustment program is through the conservation districts. It will also reduce the support available in research.

The Biological Survey, included in the Department of the Interior since July 1, 1939, has an increase of \$932,079 to make a total of \$5,863,293. With recommended cuts in several projects, the increase is accounted for by an addition of \$1,000,000 to make \$2,500,000 available for federal aid in wildlife restoration under the Pittman-Robertson Act.

National Parks

The National Park Service having been relieved of most of its responsibilities for administration and management of federal building since July 1, 1939 now has a budget which represents the cost of administering and developing national parks, monuments, and military reservations. Roads and trails on national forests and national parks are now part of the federal Public Works Program.

For forestry, wildlife, erosion control, and recreational activities of the Tennessee Valley Authority, a total of \$429,000 for the coming year is recommended. This is \$5,000 below the current year.

No report has been made on S. 2009 by the conference committee headed by Senator Burton K. Wheeler and Representative Clarence F. Lea. Suggested amendments to this bill, which covers proposals for railroad relief, would return some 20,000,000 acres of railroad grant lands to the federal government, in partial reimbursement for abolishing preferential rates under which the land grant railroads are now serving the government.

Tinker Joins Pulp and Paper Association

E. W. Tinker, assistant chief in charge of state and private forestry for the federal Forest Service, resigned early in January to become executive secretary of the American Pulp and Paper Association. He will be the fifth technically trained forester to hold the position, and will coordinate the activities of twenty-two associations in the United States concerned with pulp and paper production.

A native of Michigan, and a graduate of Michigan State College and the Yale Forest School, Mr. Tinker became associated with the Forest Service in 1915. In 1929 he was appointed regional forester of the North Central region, with headquarters in Milwaukee, and in 1936 was named assistant chief of the Service in Washington. His duties included administration of the Clarke-McNary law providing governmental cooperation with states and individuals.

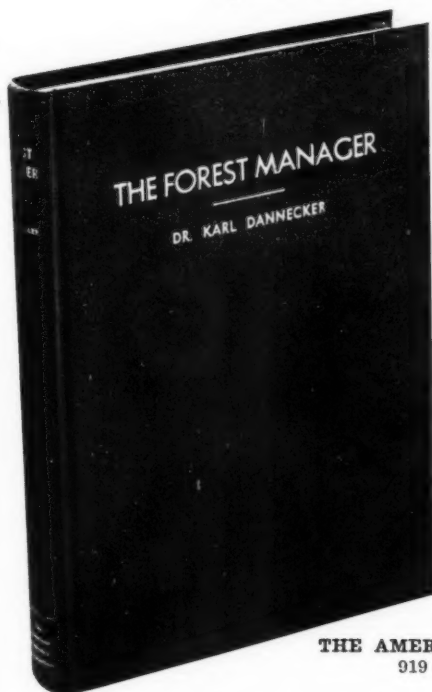
A year ago Mr. Tinker was assigned to organize the New England Timber Salvage Administration.



E. W. Tinker

THE FOREST MANAGER

By DR. KARL DANNECKER



THAT owners of farm and other small forest holdings may have a better understanding of the management of their properties, The American Forestry Association has just published **THE FOREST MANAGER** by Dr. Karl Dannecker.

This book is a translation of a German forestry classic, describing the application of forest management to privately owned forest lands, based on years of experience in Germany.

THE desire "to help the farm woodland owner in his search for the knowledge necessary to handle his forest in an orderly manner" was the motivating idea of the author. **THE FOREST MANAGER** tells, for example, why the selection forest is both economical and profitable; why and how the natural forest form should be retained.

PRICE \$2.00

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A full range of blade adjustments in all working positions, eight-speed transmission, one-piece narrow frame, hydraulic control, wide front axle, leaning front wheels, scientific weight distribution . . . are just some of the many features you will like about this machine.



A FIELD GUIDE TO THE BIRDS, by Roger Tory Peterson. Houghton Mifflin Company, Boston, Mass. 180 pages, illus. Price \$2.75.

This is the revised and enlarged edition of a standard book for field identification of birds, carrying new and interesting notes on songs and ranges. Covering all species of birds found regularly east of the Rocky Mountains, the new plan enlarges, too, on the importance of color values in identifying birds at a distance. The lavish illustrations and diagrammatic drawings add a great deal to the value and usefulness of the book.

BOOK OF THE BROADLEAF TREES, by Frank H. Lamb. Published by W. W. Norton and Company, New York City. 367 pages. Illustrated. Price \$3.75.

This book includes a treasury of dendrological facts, with a generous and interesting interweaving of superstitious folk lore on some four hundred broad-leaved trees. As in his "Sagas of the Evergreens," Mr. Lamb writes with vigor and a degree of poetic interpretation for the lay reader rather than the exacting scientist. His purpose is "to paint an impressionistic picture of the world's forests as a necessary part of a biotic unit which includes other plants, the animals and insects."

While American broadleaf trees usually occupy the center of the stage they do not dominate it, and one finds reference to many of the broadleaf trees of the entire world. Well chosen illustrations help reveal the beauty of broadleaf trees in winter as well as in summer.

AMERICAN MAMMALS, by W. J. Hamilton, Jr. Published by McGraw-Hill Book Company, New York City. 434 pages, illustrated. Price \$3.75.

In a new approach to the study of mammals, the author stresses particularly their adaptation to their environment, and acquaints the student with the ancestry, the character and habits, and the distribution and economic relations of North American mammals. Interesting detailed discussion covers many phases, such as reproduction and early life, food and storage habits, hibernation and migration.

APPLIED SILVICULTURE IN THE UNITED STATES, by R. H. Westveld. Published by John Wiley and Sons, Inc., New York City. Illustrated. 567 pages. Price \$5.00.

Incorporated in "Applied Silviculture in the United States" is the substance of the "Timber Growing and Logging Practice" series of bulletins presented a few years ago by the Forest Service. To this is added a wealth of material from other bulletins, professional articles, and unpublished manuscripts. It is distinctly American, and unique in that the arrangement is by forest regions rather than by silvicultural systems.

References to forestry literature follow each of the eighteen chapters. An appendix gives the common and scientific names of the trees, insects, and diseases.

NEW BOOKS and OTHER PUBLICATIONS

A list of Selected Books on Forestry and related fields of Conservation is available to members of The American Forestry Association on request.

A GATHERING OF BIRDS, by Donald Culross Peattie. Published by Dodd, Mead & Company, New York. 379 pages. Illustrated. Price \$3.00.

This book gathers together the best that has been said about birds by the great naturalists throughout the world in the last century and a half—Hudson on the English jackdaw and the golden plover, John Muir on the ouzel, Gilbert White on the swift, Buffon on the nightingale, William Beebe on the hoazin, Chapman on the flamingo, Thoreau on the loon, Audubon on the trumpeter swan and the passenger pigeon, to mention a few. Mr. Peattie has introduced each writer with a long informal preface, sketching his life and pointing out his particular contribution to the literature of birds. A book of authority and charm.

LEAVES AND STEMS FROM FOSSIL FORESTS, by Raymond E. Janssen. Published by the Illinois State Museum, Springfield, Illinois. 190 pages, illustrated. Price \$1.25.

The Langford collection of fossils, probably the finest ever assembled from the Mazon Creek region of Illinois, is here described. It is exhibited at the State Museum. From these delicate specimens and fragmentary leaves, the ancient record of Illinois plant life is interpreted by Prof. Janssen, who has the faculty of embodying scientific information in simple language, in a direct and entertaining manner for the general reader.

CHARACTERISTICS OF MODERN WOODS, published and distributed by Roddis Lumber and Veneer Company, Marshfield, Wisconsin. 54 pages.

A comprehensive list of practically all of the commercial woods with comments concerning the uses and current values, prepared by George N. Lamb of the Mahogany Association, Inc., in cooperation with a group of authorities on wood.

The publications listed below must be ordered direct from the addresses as given and not through the Association.

The Black Rock Forest — Ten Year Progress Report, 1928-1938, by Henry H. Tryon, with an introduction by Dr. C. F. Korstian. Bulletin No. 10, published at Cornwall-on-the-Hudson, New York. Price \$1.50.

Evergreen Windbreaks for Iowa Farmsteads. Extension Circular 217, Iowa State College, Ames, Iowa.

The "Two-Cut" System of Forest Liquidation in the Lake States Region, by Charles H. Stoddard, Jr. A study made under a fellowship awarded by the Charles Lathrop Pack Forestry Foundation and published by the Foundation, at 1214 Sixteenth Street Northwest, Washington, D. C.

Flood Control in Germany, by W. W. Wanamaker. Published by the Oberlaender Trust, 225 South Fifteenth Street, Philadelphia, Pa.

Sanctuary and Nature Trail Survey, made in 1939 by the Conservation Committee of the Garden Club of America.

Muir Woods National Monument, by J. Barton Herschler. A useful bibliography published by Mr. Herschler at Estes Park, Colorado. Price 35 cents.

Farm-Forest Facts, by E. Laurence Palmer. Cornell Rural School Leaflet No. 2. N. Y. State Col. of Agr. at Cornell, Ithaca, N. Y.

Fields in Winter, by E. Laurence Palmer. Cornell Rural School Leaflet No. 3, as above.

Americans At Work—The Forest Ranger. Published by The Columbia Broadcasting Company. Radio Committee, Nat. Vocational Guidance Assn., 425 West 123rd Street, New York City. Price 10 cents.

Fees and Charges for Public Recreation — A Study of Policies and Practices. National Park Service, U. S. Dept. of Int. Supt. of Docs., Washington, D. C. Price 40 cents.

Community Forests, by Nelson C. Brown. For. Serv., U. S. Dept. of Agr. Supt. of Docs., Washington, D. C. Price 10 cents.

Silting of Reservoirs, by Henry M. Eakin and Carl B. Brown. Tech. Bull. No. 524. Soil Conservation Service, U. S. Dept. of Agr. Supt. of Docs., Washington, D. C. Price \$1.00.

A Land Program for Forest County, Wisconsin, by V. Webster Johnson, Sidney Henderson and James H. Marshall. Tech. Bull. No. 687, U. S. Dept. Agr. Supt. of Docs., Washington, D. C. Price 15 cents.

Colorado's Poisonous and Injurious Plants, by L. W. Durrell and I. E. Newsom. Bulletin 455 of the Colorado Experiment Station, Colorado State College, Fort Collins, Colo.

Prevention and Control of Gullies, by Hans G. Jepson. Farmers' Bulletin 1813, Soil Conservation Service, U. S. Dept. of Agr. Supt. of Docs., Washington, D. C. Price 10 cents.

AMERICAN FORESTS

Foresters Look to Next Thirty Years

A broad and intensive analysis of the next thirty years in forestry was the keynote of the 39th annual meeting of the Society of American Foresters, held in San Francisco November 23, 24 and 25.

With more than four hundred members from all sections of the country attending, the conference heard leading West Coast foresters and economists propose various programs to bring about the practice of forestry on privately owned timberlands.

Among the most controversial was a nineteen-point program of government ownership of forest resources proposed by George M. Peterson, economist, of the University of California. A program of strict federal regulation was interpreted by Dr. E. P. Meinecke, recently retired after many years of service with the United States Department of Agriculture. Dean D. S. Jeffers of the University of Idaho, offered a program of subsidized forestry, followed by one by Clyde Martin, calling for industrial self-regulation of the Western Pine Association. Finally, a program of education and cooperation was offered by Stephen N. Wyckoff, director of the Pacific Northwest Forest and Range Experiment Station. The summing up was undertaken by John B. Woods, of the Oregon Forest Fire Association.

William H. Price, of the Weyerhaeuser Timber Company, proposed a system for planning for tomorrow's forest crops. Problems of fire protection in California were outlined by DeWitt Nelson, of the Federal Forest Service. E. T. F. Wohlenberg, also speaking for the Forest Service, presented what many lumbermen considered the highlight of the meeting. He defined and explained the federal requirements to obtain "accelerated depletion" for selective logging in western commercial forests.

A departure from customary forestry programs was the half-day session taken over by young foresters, whose papers and discussions covered the general fields of forestry and water, private forestry practice, forestry education, and fire problems. So logically were the papers prepared and so ably presented that not a few senior members conceded that the young generation of foresters "know the game from all angles."

Closing the meeting with a session on forestry research in the next thirty years, four research workers described techniques and accomplishments in their fields. Charles A. Connaughton, of the Rocky Mountain Forest and Range Experiment Station, showed how water and forage production was essentially a forestry problem. Research in forest utilization as carried on by the Western Pine Association was explained by Albert Hermann. A review of reforestation problems was contributed by Arthur G. Chapman, of the Central States Forest Experiment Station. A. J. F. Brandstrom, of the Pacific Northwest Forest and Range Experiment Station, concluded with a discussion of an economic base for silviculture.

RECENT WILEY BOOKS

APPLIED SILVICULTURE IN THE UNITED STATES

By **R. H. WESTVELD**, *Professor of Silviculture, University of Florida.*

This book deals with the application of principles and practices of silviculture directly to specific conditions found in the various important forest regions of the United States. Detailed information is given on the reproduction requirements and growth requirements of the important trees of the United States.

567 pages; 102 illustrations; 6 by 9; \$5.00

BIO-ECOLOGY

By **FREDERIC E. CLEMENTS**, *Ecological Research, Carnegie Institution of Washington,* and **VICTOR E. SHELFORD**, *Professor of Zoology, University of Illinois.*

This book opens with a discussion of the scope and development of the concept of "bio-ecology." Succeeding chapters offer a general treatment of the dynamics of the biotic formation, the influence of community on habitat, the interrelations of organisms, and other important phases of the subject, including detailed discussions of the characteristics of certain land, aquatic and marine biomes.

425 pages; 85 illustrations; 6 by 9; \$4.50

OUR NATURAL RESOURCES AND THEIR CONSERVATION

The late **A. E. PARKINS**, *Editor-in-Chief*; **J. R. WHITAKER**, *Associate Editor*; and 21 Other Contributors.

New statistics and new graphs were incorporated in this revised edition. A number of the chapters were revised to fit changing conditions. An entirely new chapter on the conservation of commercial fish was written by Professor H. H. Martin of the University of Washington, and is inserted following the chapter on "Wild Life." Every effort was made to modernize the presentation.

647 pages; 119 illustrations; 6 by 9
Second Edition College Edition, \$4.00; Professional Edition, \$5.00

GROWING PLANTS IN NUTRIENT SOLUTIONS

By **WAYNE I. TURNER** and **VICTOR M. HENRY.**

A lucid and practical exposition of what is being done today in the large-scale growing of plants in nutrient solutions. The book gives exact methods of starting and continuing nutrient culture, formulas, photographs of actual crops and installations, working drawings of construction of efficient greenhouse layouts, sketches of actual bench construction, typical equipment, etc.

154 pages; 29 illus.; 3 color plates; 6 by 9; \$3.00

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FOREST LAW

THE ESSENTIALS OF AMERICAN TIMBER LAW

By **J. P. KINNEY**, U. S. Department of the Interior.

A book on trees and forest products as property.

308 pages, cloth binding, Published at \$3.00.

THE DEVELOPMENT OF FOREST LAW IN AMERICA

By **J. P. KINNEY.**

A discussion of early and basic conservation Enactments.

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BOOK OF THE BROADLEAF TREES

By **FRANK H.
LAMB**

Author of
Sagas of the Evergreens

Over four hundred varieties of temperate broadleaf trees, together with related facts about their history, cultivation and present use are described in this book by an outstanding authority. Of particular interest are the pages devoted to the uses of various types of wood throughout the ages and their characteristic influence on construction and design.

The author has spent more than forty years in intensive study of the trees of the world. He has circled the globe to visit the important forests of the world, including every forest area and industry in the United States. As a result of his close association with trees, his text conveys a warmth and spirit usually lacking in books of this category. Illustrated with photos from the four corners of the earth. \$3.75

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FEDERAL NEWS AND REVIEWS

Conservation as a dynamic, growing thing and the achievements of the several bureaus of the Department of the Interior in striving for wise use of our natural resources, marks the central theme of the annual report of the Secretary of the Interior for the past year. Special reference is made to the inclusion of the Bureau of the Biological Survey and the Bureau of Fisheries within the Department and a system of sustained yield production which has been established within the forests of the public lands, particularly those of the O and C revested land grants. The successful culmination of the long fight to acquire the Carl Inn tract of sugar pines for addition to the Yosemite National Park, together with other additions and boundary adjustments, increased the area within the national parks by 1,623,295 acres to a total of 20,817,228 acres. Pending the establishment of the proposed Kings Canyon National Park in California, on which favorable action has been taken by the House, Secretary Ickes reports that negotiations have begun for the acquisition of various additional tracts to be made part of the park area.

Olympic Park

The further addition of nearly 200,000 acres to the Olympic National Park, in northwestern Washington, was authorized by Presidential proclamation of January 2. Under this proclamation, 187,411 acres were added to the 648,000 acres previously embraced within this park, with the result that it now includes 835,292 acres. The addition includes the northern shore of Lake Quinault, an extension to the northern edge of Lake Cushman, and a buffer area north and west of Lake Crescent.

After five years of administration of grazing on the federal range, Secretary Ickes reports that grazing licenses and permits were issued to 19,342 stockmen on 11,032,642 head of livestock in fifty grazing districts. Collection of fees for the grazing of this livestock totals \$833,385, while the appropriation was \$650,000.

The Secretary declared that including the land in the territory of Alaska, the Department of the Interior is responsible for the management of 600,000,000 acres of public lands. This includes 2,500,000 acres within the O and C and the Coos Bay Wagon Road revested land grants, and approximately 50,000,000 acres of public domain outside of grazing districts.

Biological Survey Reports

The Biological Survey, which has been a part of the Department of the Interior since July 1, 1939, submitted to Secretary Wallace the last of its series of fifty-four annual reports. The outstanding operation during the past year, according to Dr. Ira N. Gabrielson, chief of the Bu-

reau, was the operation under the Federal Aid to Wildlife Restoration Act and the substantial progress in waterfowl restoration. At the close of the first year of the Federal Aid program, he reported the enactment of legislation giving assent to the program by forty-two states. A similar bill is pending in one state and only five states remain ineligible. Under the Federal Aid Act, the report points out, Congress may authorize operating appropriations not to exceed the annual revenue from the ten per cent tax on sporting arms and ammunition. The current appropriation for this work is \$1,500,000.

The development of action programs relating directly to conservation and land use, and the reorganization of the Department of Agriculture to that end marks, in the opinion of Dr. H. H. Bennett, chief of the Soil Conservation Service, "a new philosophy that is developing across the country with respect to the land." At the close of the fiscal year, his report points out, the Soil Conservation Service had conducted work in forty-seven states and Puerto Rico, covering more than 200,000,000 acres. This gives further support to the conclusion of the Bureau's chief that a nation's soil is its most valuable and basic natural resource.

The CCC

The annual report of Director Robert Fechner of the Civilian Conservation Corps was almost prophetic in his description of his six and a quarter years as a director of an independent agency, prior to its inclusion on July 1, 1939, as a part of the Federal Security Administration. "While in general," Director Fechner pointed out, "conservation programs throughout the country have been advanced by from ten to twenty-five years, a tremendous amount of work remains to be done. A survey conducted during the year indicated that work projects already suggested by federal and state departments would keep a CCC of 1,500 camps busy for from thirty to fifty years."

During the past year more than 267,000,000 forest trees were planted, forest stand improvement was completed on 290,000 acres, tree and plant diseases and pest control operations were carried out on 1,346,000 acres, rodent and predatory animal operations were extended over 3,079,000 acres, and 684,000 man-days were devoted to fighting forest fires.

In this direction the possibility of giving military training to the CCC boys continues a subject of major interest. Recent newspaper reports indicate that Chairman Andrew J. May, of the House Military Affairs Committee, is strongly of the opinion that such training should be given. No bills to this effect have been introduced in the current session, however.

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Colorado Beaver

(Continued from page 71)

hides bring about twice as much as United States pelts, so the fur racketeers do their double slight of counterfeiting in affixing the faked Canadian seal to raise the profit. This is reminiscent of the liquor bootlegging days except for one fact; the best dark Colorado hides equal in all ways the best Canadian pelts. From these houses the "Canadian" pelts find their way to legitimate dealers who may suspect but never know, that one hide may be "hot" and another genuine and legal.

The Weeks Law, making interstate transportation of "hot fur" a federal offense is beginning to operate. Last December, in one swift raid, nine poachers near the "Four Corners" country were caught by federal and state men. The leader was fined \$500 and sentenced to nine months in Leavenworth. Another drew the same fine, a six months sentence and deportation because he was an alien. After this happens several times, the "hot beaver" racket may become unpopular. Particularly when local residents realize the damage a poacher does to water flow and other values inherent in the beaver colony.

In Colorado's beaver proposals lies a new application of a principle conservationists long have advocated. The wildlife resource, under management, can supply the funds properly to maintain itself. Returns to the state from wildlife can underwrite hunting and fishing if the income derivable is "plowed back" into building up all phases of the resource. Colorado's possible crop of 100,000 beaver pelts, if sold at the current average of \$10 a hide, can supply money badly needed to build up fish carrying capacity of the streams, rehabilitate habitat for upland birds, establish game refuges, and assure funds for their adequate administration.

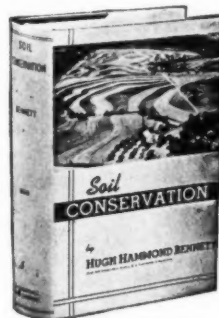
All these considerations are involved in Colorado's beaver survey and the management plan to follow. The survey itself approaches the problem much as a stockman would appraise his herds and range to arrive at his program for handling his fields and animals. In those areas already covered, pace surveys were made of individual streams, the carrying capacity of water and food estimated, the type of slopes, soil, and stream bed recorded. An estimate of the number of beaver to be planted on suitable sites has been made; likewise an estimate of the annual crop that must be taken when a stream reaches its carrying capacity to keep animals and food supplies in balance.

This is pioneer work. No claim is made that the survey and the plans based on it are a final answer for any stream. A time may come when appraisals may be reduced to a general formula, but the start has been made in Colorado toward handling the state's beavers on a systematic basis so the greatest benefits may be obtained.

(Continuing on page 96)

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AROUND THE STATES

Highlighting the state news of the month was an announcement that the Wisconsin legislature had reviewed practically the entire volume of state conservation laws, deleted many sections, added amendments to others, and wrote a number of new provisions—all in the interest of clarification.

Among others, the law providing that public lands be sold at public auction was changed to permit an exception so that land in the possession of one state department can be turned over to another state department at appraised value.

A new law drops the minimum penalty that can be assessed for violating conservation laws to \$10—with a \$50 minimum for violations involving deer, bear and sturgeon.

A new provision for setting up game farms provides that the value of the wildlife on the tract be assessed by a committee of three, the conservation commission to name one member, the applicant another, and the two a third.

Another act empowers the conservation department to cooperate with the federal government in wildlife restoration projects.

New language added to the requirements for obtaining resident hunting, trapping and fishing licenses provides that they are to be issued only to persons who shall present definite proof of their identity and that they are legal residents of the state. Another provision is that no person between the ages of twelve and sixteen years may hunt unless accompanied by parent or guardian.

Indiana Presents Forestry Needs

Need for increased federal participation in Indiana's program of forestry was recently outlined by a group of conservationists before the Joint Congressional Committee at Milwaukee.

Federal cooperation is needed, it was brought out, in the training of teachers in the basic principles of good forestry; in additional protection of woodlands from fire; in a program to reforest approximately a million acres within the next ten years; in speeding up acquisition of land for national forest areas within the state; and in continuing and enlarging the activities of the Civilian Conservation Corps in the field of forestry.

It was stated that of the 19,000,000 acres of hardwood forest once covering the state, but 4,000,000 acres remain, and that the annual lumber production of about 200,000,000 board feet is progressively becoming poorer in quality.

Florida Plants 7,000,000 Pines

Down in Florida it was announced that by late January more than 7,000,000 pine seedlings will have been planted by landowners in the state since November. More

than 100,000 young pines are being shipped daily from the Olustee Nursery of the Florida Forest and Park Service, it was stated.

Practically the entire tree crop is of slash pine, with a small amount of longleaf. Due to the use of motorized equipment, and also because of advanced methods of planting and cultivation, the price of these seedlings to landowners, it was stated, has been reduced about a hundred per cent, or to \$1.75 a thousand seedlings.

Since operations at the nursery began in 1934, more than 29,000,000 young trees have been raised for reforestation of cut-over lands in the state.

New Mexico's Modern Bethlehem

On December 10, the little mining town of Madrid, about twenty miles south of Santa Fe, New Mexico, was transformed into a modern Bethlehem. On that day Governor John E. Miles turned the switch that brilliantly floodlighted realistic scenes and figures against the pine and cedar clad hills, avenues of festooned, illuminated welcoming arches, miles and miles of glittering, living Christmas trees, gigantic lighted candles, and more than 40,000 electric lights.

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The display and pageantry continued until January 2, and during that time more than 60,000 visitors made the pilgrimage to Madrid.

Vermont Low in Maple Syrup

Vermont's traditional leadership in production of maple syrup and maple sugar is threatened because of damages to the maple groves inflicted by the New England hurricane of 1938. Figures for the past season show Vermont's production of 843,000 gallons of syrup from 3,426,000 trees as compared with 1,485,000 gallons in 1938. To produce the larger crop Vermont farmers tapped 5,438 trees, indicating a possible loss of over 2,000,000 maple trees.

Holland

(Continued from page 78)

ocean water. First, huge power plows turned over the ocean floor to expose it to rains. Drainage ditches hastened rain percolation and leaching processes. The average rainfall is twenty-eight inches annually, of which sixteen inches is evaporated, leaving about twelve inches to do the de-salting. It was astounding that in one year, a rye crop could be grown on the sandy "soils," but the clay "soils" contained up to four times the total amount of salt of sandy soils and required two to three years of fresh water percolation, to leach out salts sufficiently for the growth of vegetation.

Wind and water erosion on the floor of the North Sea began as soon as it was exposed without cover, to the winds and rains; whereas centuries of ebb and flow of tides had caused little erosion. The poorer sandy soils, unsuitable for agricultural crops, were set aside for communal forests. On these lands wind erosion started almost immediately. The foresters rushed millions of trees and shrubs, some twenty species tested for these soils, on to the exposed areas. The cottonwood and alder produced the most rapid growths. The communal forests serve a four-fold purpose; they prevent the menace of wind erosion on poor lands to surrounding farms. They furnish the inhabitants with timber and fuel in continuous supply through controlled cutting. The income from such sales will reduce taxes for dis-

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8-15 in. X	\$10.00	\$70.00		12-18 in. XX		10.00	55.00
Colorado Blue Spruce		6.00	40.00	Douglas Fir (P. taxifolia)			
8-10 in. X	\$4.00	11.00	80.00	8-15 in. XX		18.00	110.00
Austrian Pine				Hemlock (Tsuga canadensis)			
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Sugar Maple (A. saccharum)				Black Walnut (Juglans nigra)			
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4-6 ft. X	65.00	550.00		Tulip Tree (Liriodendron tulipifera)			
Paper Birch (Betula papyrifera)				12-18 in.		4.00	20.00
12-18 in.	6.00	35.00		2-3 ft. X	\$3.00	9.50	75.00
Red Bud (Cercis canadensis)				Northern Red Oak (Quercus rubra)			
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2-3 ft. X	\$7.00	25.00		4-6 ft. X		65.00	550.00
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trict administration. The forests already provide recreation areas which game specialists have already stocked with Chinese pheasants, rabbits and other edible game.

Experts rushed the land into cultivation by tested formulae of rotations, fertilizers and cropping, until there was sufficient lime, phosphates, potassium, and nitrogen to grow crops of wheat, barley, rye, pasture, sugar beets, potatoes, cabbages and other crops. After three years of preliminary nursing by experts, the farms are sown to alfalfa or clover. When the land is fully covered by this crop, it is ready to be weaned, and to be turned over to individual farmers for cultivation to crops.

When all four sections of this new "Dutch made heaven on earth" are completed, there will be many thousands of completely modern farms, sufficient to support three hundred thousand persons on farms and in local town activities, and all this at thirteen to sixteen or more feet below the level of the ocean.

Entrance to this agricultural heaven is closely guarded. Only a select few—thus far an average of one in thirty seeking admittance—are able to meet the entrance requirements. A land manager, or an earthly Saint Peter, who was most gracious in giving me information, passes on all applicants for admission, whether farmers, doctors, veterinarians, and all who serve the farmers. First, past records and qualifications must prove farmers worthy of this stewardship of the land. They must have good character, be of good family and have sufficient capital to stock the farm and buy machinery. They must set up housekeeping in the model house with attractive furniture and fittings. They must have financial backing to carry them over a possible crop failure. If money must be borrowed, it must be from a relative and not from a bank, on the assumption that the former would be more lenient. It is not intended that farms fall into the control of financial interests or bankers. Rent of \$12 an acre is paid annually to the government, increasing to a maximum of \$21.60 an acre as production increases. All town buildings, public and private, are also rented. When this project has returned to the government the initial expenditure, it may then be possible for farmers to obtain complete ownership.

All farmers are on probation for six years. Technical advice, which the farmer may use or not as he wishes, is furnished free. But at the end of six years

he must give an accounting of his stewardship of the land. If he is found wanting in the use of the land, he is cast out and his opportunity is taken from him and given to one more worthy.

The gains of this type of "conquest," which the Dutch jokingly speak of as their "Imperialism," cannot be fully evaluated so soon, for they are national assets of inestimable value for generations to come. The first gain to Holland is the addition of 550,000 acres of fertile lands in a small, definitely agricultural country. Second, the danger of inundations and loss of life and property is over. Instead of the former upkeep of 200 miles of dangerous ocean dykes, against which north winds from the Arctic piled up storm waters far beyond high tide levels, there are only twenty-six miles of practically indestructible ocean dyke. Less expensive fluvial dykes now suffice for the new tideless lake. Third, at last Holland will have a much needed, huge, sweet-water storage lake, for supplying irrigation and drinking waters for new and old areas, valued at well over eighty million dollars. This lake will eliminate also a two million dollar annual cost of maintaining a constant canal level for transportation and also prevent future losses from droughts in the two provinces of North Holland and Friesland. Fourth, instead of the long and circuitous routes from commercial centers, this ocean dyke brings speedy communication between Amsterdam, Rotterdam and the Hague.

The other gain, which cannot be computed in dollars and cents, is the satisfaction and stimulus to the Dutch in the accomplishment of a difficult and worthy task well done. Thousands have rejoiced in the privilege of working to create this national asset for present and future generations. The entire country appears to be a well regulated, prosperous and happy household, content to stay at home, with honest pride in its beauty, its products, artists, engineers, and its accomplishments—truly an example and inspiration to all other nations for the development and conservation of their own potential materials and human resources.

Holland has chosen the better way. If civilization is to be saved, nations must find other solutions than war. When all methods of mass destruction of life and property are in the hands of every nation, war becomes national suicide. All continents are occupied, there are no new lands to colonize. Conservation rather than conquest is the solution to needs of nations. The Dutch have fought and won new lands, not from other peoples but from the soulless sea. The cost is less than a war of aggression.

If all the distracted nations in the world family would thus attack the solution of their population problems by conservation and development of potential resources, creating wealth and making the national home more habitable for future generations, instead of resorting to the costs and horrors of modern war, a new era of harmony, stability, and progress would encircle the earth.

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Monuments That Grow

(Continued from page 76)

to Urania, under the guidance of Prof. Chapman, and here in the pine-clad hills of central Louisiana, made famous by the devotion, energy, and wisdom of Henry Hardtner, these young men complete their course of study.

When Urania was founded, the small circular sawmill—cutting 25,000 feet of lumber a day—supported only a small population. In 1939 the double band mill, manufacturing 80,000 feet a day, the planer mill, kilns, machine shops, commissary, garage, ice plant, light plant, and numbers of smaller enterprises, supported fifteen hundred happy people. It is strictly a company town, owned and operated by the Urania Lumber Company, with Quintin T. Hardtner as President and General Manager. Even the beauty parlor is conducted by company employees. There are no town officials; the only officer living in the community is a deputy sheriff, and he resides here by preference. There has never been a homicide in Urania.

When the mill was first established in this wild, and untamed part of the state, there were many dire and doleful prophecies as to what the hill-billies would do to these intruders, but when the company drew upon this sparse and scattered population for its employees a feeling of pride was immediately generated. When these farmers, suddenly transformed into the sawmill laborers, learned that their employers would not tolerate the brewing and drinking of alcoholic liquors, an unwritten law was promulgated. It applied primarily to newcomers and transients: "Either reform or move on." No statutes in the law books have ever been more effective.

When Henry Hardtner proved his theory that the company owned forests could be made to produce timber sufficient to operate the mill "as long as we have a nation," plans for permanent buildings were inaugurated. Today the homes of employees are beautiful and comfortable, equipped with modern conveniences such as electric lights, natural gas, water and sewerage.

Most of the original employees have remained faithful and steadfast. The population of the town is largely composed of second and third generations, working by the side of grandfathers who are still serving the only employers they ever had. Youngsters are happy in the realization that their grammar and high school ranks with the best in the country, pointing with pride to the five attractive buildings, artistically arranged and designed.

When one of the employees of the Urania Lumber Company was asked about government relief he lunched his shoulders back proudly and said "Like Will Rogers used to say, all we know is what we read in the papers. Propound that question to any person in Urania and his answer wouldn't be admissible in court because it would be hearsay evidence. He certainly

wouldn't speak from his own personal knowledge."

At the present time there is a civic movement underway for beautifying the town. This work had its inception in the planting of a lane of crepe myrtle trees for a mile along the highway and extending through the business section. Flowers have been planted in appropriate places, a colorful and picturesque rest room, similar in design to the old log cabin, has been constructed. The Henry E. Hardtner Memorial Park is a conspicuous example of what can be done when artistic temperament is supported by energy and enthusiasm. Numerous private gardens, notably those around the Hardtner and Tannehill homes, lend a touch of beauty to the town and set worthy examples for others to follow.

No event throughout the year is of more importance to the people of Urania than the coming of the forestry students from Yale College. Although the personnel of these classes changes each year, their hosts eagerly look forward to the arrival of Prof. Chapman and his group of students. For a number of years Prof. R. C. Bryant, co-worker with Prof. Chapman, was greeted with genuine hospitality each spring, and his passing away last January brought sorrow to the people of Urania.

"The most scientific and accurate calculations, with a liberal deduction to make our figures bedrock and conservative, show that in 1988 there will be 30,000 feet of timber to the acre, or 45,000,000 feet of timber on the 1,500 acres of the Herman H. Chapman Forest," predicted Henry Hardtner before his death.

"At \$20.00 a thousand stumpage, the Chapman Forest in 1988 should be worth \$600 an acre, or \$900,000 for poor, sandy, piney-woods land that now goes begging in places for \$2.00 an acre."

It seems that a successful forester must not only roam the woods and observe such commonplace antics as the rooting of razorback hogs, but he must delve into the lore of the ages, for among the writings of Henry Hardtner we find:

"Let us for the moment consider the forestry of early historical times. Though Moses was forbidden to enter the Promised Land, God granted him the privilege of seeing it before his death. From the summit of Pisgah, a mountain on the border of Moab, he viewed the Promised Land. What a wonderful vision! Forests of pine, poplar, palms and oaks; clear springs and running streams; birds, game,



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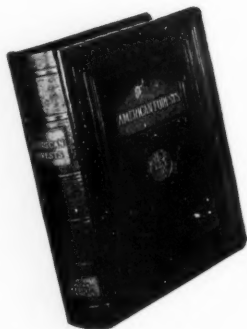
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and fish; undulating hills and fertile valleys; agricultural land capable of producing abundant crops of corn, flax and wheat; meadows and pasture lands for the cattle, and a climate that was pleasing, healthful and healing! All nature was glad and joyous, and the sighing of the pines was sweet music to Moses as he stood on Pisgah's heights, his vision penetrating to the farthestmost boundaries of the land.

"But time rolls on and we read of Solomon whose wisdom 'excelled the wisdom of the children of the east country, and all the wisdom of Egypt . . . And he spake of trees, from the Cedar Tree that is in Lebanon even unto the Hyssop that springeth out of a wall.'

"Now comes the lament, the sorrow,

and the pleading over the distress caused by forest fires, as we read it in the book of Joel. 'Oh, Lord, To Thee will I cry; for the fire hath devoured the pastures of the wilderness, and the flame hath burned all the trees of the field. The beasts of the field cry also unto Thee; for the rivers of waters are dried up, and the fire hath devoured the pastures of the wilderness.'

Urania—the garden of the Heavenly Muse—affects one strangely, infusing its uncanny power of creation and drawing from one's memory quotations from Walt Whitman and the Psalms. The pines seem to glorify the man who saved them. Standing there you recall that the Lord said: "I will liken him unto a wise man, which built his house upon a rock," and you think of Henry E. Hardtner.

PUZZLE PICTURE NO. 2



This odd-shaped tree is found in the deep South. It is known to foresters by a special name and its freak growth is the result of a definite principle of plant growth. Can you solve the puzzle by answering the following questions? (1) What name have foresters given it? (2) What is the reason for its peculiar growth? For correct answers, turn to page 96.

Have you a "Puzzle Picture" among your photographs? If so, submit it to the "Puzzle Picture Editor," American Forests, 919 Seventeenth Street, Northwest, Washington, D. C. Pictures selected for this series will bring their owners a year's free subscription to American Forests. So get out your album and see what you have.

Trees Do Not Lie

(Continued from page 68)

it? Many archaeologists used to think so.

But we know now that building continued in Chaco Canyon at least till 1127. Timbers preserved in the ruins tell us. Thanks to the dry air, there has been little decay. The Chaco was booming when William the Conqueror was subduing England in 1066; and probably was inhabited up to the middle of the 12th Century. Then, the record shows, these great pueblos and the Canyon itself were abandoned.

Forests originally grew to the edge of the Chaco, perhaps down in it. That's hard to believe now. But the ceiling poles and kiva pilaster supports used by the Indians were fine pine logs. The nearest pine forests today are sixty miles away and the Indians had no beasts of burden.

So large a population used a lot of wood. Mother trees went with the rest. The forest could not re-seed itself. Rainfall is not heavy here at best, trees get a slow and difficult start. With the natural economy of the land thrown out of balance nature took her revenge. The tree border receded. Moisture no longer sank into the ground to be used at leisure by growing things, but hurried off with erosive force, cutting a precipitous gash through the center of the Canyon. A man-made desert intruded where fields had been, and man departed. Rain continued to come, as much as ever year in and year out. But now it was a destroyer.

That's the story of the Chaco as we translate it from tree documents. It has modern overtones, hasn't it?

Searching for material, Douglass looked longingly at ancient timbers in the high Hopi towns. The Hopis are the Snake Dance people; they strongly disliked letting the astronomer saw sections or remove cores from their homes. He made everything all right by putting turquoise in all holes bored, donating six turtles for ceremonial rattles, and twenty old felt hats for Bean Dance masks. One Hopi timber gave a ring date of 1260.

Timbers of a wrecked ship lie on Manitoulin Island, in Lake Superior. Some people think it's the wreck of the *Griffon*, built by the explorer LaSalle. One of these days we may know for sure. Samples of living and old trees are being collected in the neighborhood of Buffalo, where the

Griffon was built. If the cutting date of the wreck timbers is the same as the date of building the *Griffon*, we may be pretty sure it's LaSalle's old ship.

There are fewer than fifteen professional dendrochronologists in the United States; and that means the world.

More and more attention is being paid to this new and strange science. The Forest Service has used it to learn about insects. The TVA installed a tree-ring department, for the light it could throw on rainfall and therefore on dam building. Archaeologists constantly use dendrochronology to date ruins and pre-historic population movements. Biologists are using it to compare reactions of native and imported trees to weather variations. Climatologists trying to master long-range weather forecasting, learn from trees a host of facts otherwise unavailable. Three universities, Arizona, New Mexico, and Chicago, teach and do research in dendrochronology.

Cross-sections or borings from old log cabins, covered bridges, piers, barns, taverns, are excellent material for tree-ring analysis; likewise samples from very old trees and virgin forests. Many lumbermen, keenly interested, send samples from the oldest trees they get. A specimen collected by the manager of a stove mill near Brushy, Missouri, had a radius of only fifteen inches, but was found to go back to 1569. A specimen from Owl's Bend in the Ozarks was thirty-three years older. If logs buried in streams, swamps, or lakes are covered by water continuously so that decay has not set in, they make fine specimens.

The sort of tree sample needed for ring analysis may be a complete cross-section. But a wedge-shaped piece cut from bark to center ring ordinarily does just as well. On standing trees a special tool takes a small sample from bark to center without injuring the tree.

Laboratory techniques are not complicated. On solid modern wood you slice a smooth path from bark to center with a safety razor and squirt kerosene over the cut to bring the rings clearly to view. A hand lens which magnifies to ten times natural size will do, but a high-powered microscope is better. In the Chicago lab-



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oratory, rings are measured with a special machine which does much of the eye-straining work automatically. Fragile charcoal and logs long buried in damp soil may be wrapped securely, covered at the ends with cheesecloth bands, and immersed in warm gasoline saturated with paraffin. When the ends are hardened with a plastic dissolved in acetone, the wood can be cut cleanly. Permanent records of important specimens are made with the camera, with special lighting to show up the rings.

There are certain special problems. For instance, missing rings; if conditions are very difficult, a tree sometimes fails to put on any growth for a year. Sometimes there are double rings, signifying a dry winter and spring and a wet summer. Frost rings may be found in young trees particularly: a late frost breaks the wood of the last ring and leaves a permanent mark. Insects may defoliate a tree so that it fails to grow much, even with plenty of moisture. Lightning may leave legible scars, so may fire. Unfavorable temperatures at times affect tree growth as much as lack of moisture. These problems add to the complexity of the science, but also to its interest, for they tell us just that much more about what the trees have been through.

Colorado Beaver

(Continued from page 89)

Almost exactly a century ago, the mountain men were bent on cleaning out the last beaver in Colorado. The fur business, almost wholly dependent on beaver, died. Perhaps the cycle is now complete. One might indulge in a bit of philosophy in that thought—the men of today recapturing what men of yesterday almost destroyed. Colorado is starting a systematic program for putting her beaver to work—not for one interest or group, but for the good of the state. That's the significant thing; the new outlook and the planned approach to wildlife management.

ANSWER

To Puzzle Picture No. 2

This is known as a G-Tree. It is an outstanding example of the principle of heliotropism, that is, the continued growth toward light. In this case the small tree continued to strive toward the sun after an injury to the leader. Similar freak trees found near Biloxi, Mississippi, were first thought to be characteristic of that vicinity. They have been discovered elsewhere in the South, however, and the photograph illustrating this G-Tree was made by W. R. Mattoon of the federal Forest Service, on the Osceola National Forest, in Florida.

WHO'S WHO

Among the Authors in This Issue

OID BUTLER (*The Piney Woods Are Coming Back*) is Executive Secretary of The American Forestry Association and Editor of AMERICAN FORESTS.

W. C. LOWDERMILK (*Holland Builds a Masterpiece of Land Reclamation*) is chief



W. C. Lowdermilk

of research for the Soil Conservation Service, and has been with the Service since 1933. Dr. Lowdermilk began as an assistant forest ranger in 1915, and has been a research officer for the United States Forest Service, research professor of forestry at the University of Nanking, and project leader for erosion stream flow research at the California Forest Experiment Station.

FLORENCE M. HAWLEY and NEIL M. CLARK (*Trees Do Not Lie!*). Dr. Hawley's father, a chemist, had as his hobby the engrossing study of modern Indians and ancient ruins of pueblos, and her mother had been a school teacher in the Yuma, Arizona, district when that area was first opened for settlement, so it was quite in the tradition that she become a teacher of anthropology. Dr. Hawley teaches the first semester of each year at the University of New Mexico, and the second semester at the University of Chicago. Mr. Clark has been engaged in editorial work and free-lance writing since 1912. His articles have appeared in at least fifty magazines, and he has half a dozen books to his credit. Just recently moved to New Mexico, he's going to stay—if he keeps on liking it as well as he does now!

ARTHUR HAWTHORNE CARHART (*Colorado Garners Her Beaver*) has been writing since 1912, and some of his first articles were published in AMERICAN FORESTS, then *American Forestry*. With Stanley P. Young, he is the author of *The Last Stand of the Pack*.

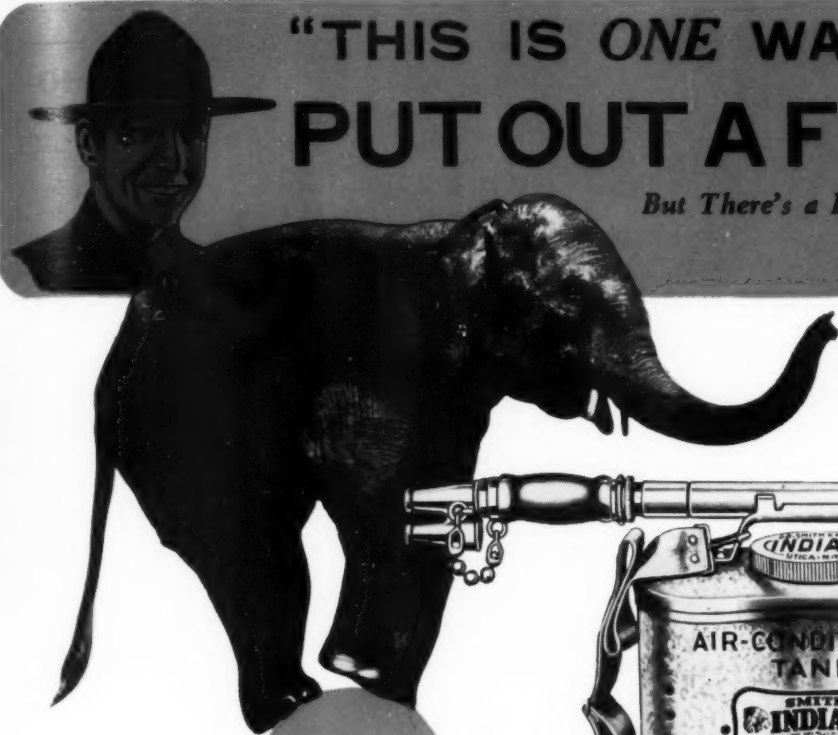
SAM MIMS (*Monuments That Grow*) was with the Resettlement Administration in Louisiana. He is now connected with the School of Journalism at the Louisiana State University.

G. H. COLLINGWOOD (*Forestry in Congress*) is Forester for The American Forestry Association.

THE COVER—*Royal Palm at the Tip of Florida*. Photograph by Devereux Butcher.

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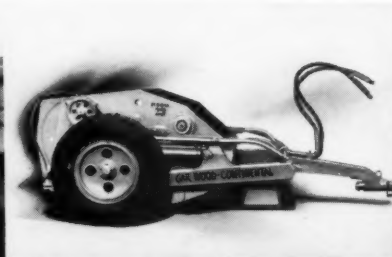
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